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George Parsons, Esq. Surgeon to the Town Infirmary, Birmingham.
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—— Porter, Esq. Surgeon, Birmingham.
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John Power, Esq. Surgeon, Leamington.
Richard Powell, Esq. Surgeon, Bristol.
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John Pritchard, Esq. Surgeon, Leamington.
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Thomas Pritchard, Esq. Surgeon, Kington, Herefordshire.

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George Rootes, Esq. Surgeon, Ross.
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T. J. Todd, M. D. Physician to the Dispensary, Brighton.
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George Wolstenholme, Esq. Surgeon, Bolton, Lancashire.
Edward W. Wright, M. D. Shipston-on-Stour.
Thomas Wynter, Esq. Surgeon, Westbromwich.

J. C. Yeatman, Esq. Surgeon, Froome, Somersetshire.
James Yonge, M. D. Plymouth; Fellow of the Royal College of Physicians.

As it is scarcely possible to avoid errors in printing so numerous a list of Members, the Secretaries are anxious, wherever they are committed, that they may be amended; and will, therefore, feel obliged, if those Members, whose names are not rightly inserted, or whose Christian names are omitted, will send a notification to them, free of postage.

PROCEEDINGS

AT THE

SECOND ANNIVERSARY MEETING

OF THE

PROVINCIAL

MEDICAL AND SURGICAL ASSOCIATION,

HELD AT BIRMINGHAM,

JULY 18, 1834.

AT half-past nine o'clock in the morning of July the 18th, 1834, the Council of the Association met at the School of Medicine, in Paradise-street, to arrange the preliminary business; and at half-past twelve the General Meeting of the Members took place at the Theatre of the Philosophical Institution in Cannon-street.

Dr. John Johnstone was unanimously called upon to preside; and it was highly gratifying to observe, that there were at this time in the room upwards of 250 persons. The venerable Sir Charles Throckmorton, Bart. of Coughton, one of the fathers of the profession, graced the meeting by his presence. There were also present the late president, Dr. Carrick, of Bristol; Dr. Edward Johnstone, one of the vice-presidents of the society; Dr. John Johnstone, president for this year; Mr. Addison, of Malvern; Dr. Arrowsmith, of Coventry; Mr. Alexander, of Corsham, Wilts; Dr. J. Bardsley, of Manchester; Dr. Barlow, of Bath; Mr. Baynham, of Birmingham; Mr. Bicknell, of Coventry; Mr. Bodington, of Kenilworth; Mr. Boulton, of Leamington; Dr. Booth, of Birmingham; Mr. Bucknill, of Rugby; Mr. Bartleet, of Birmingham; Mr. Brathwaite, of Hereford; Dr. Conolly, of Warwick; Dr.

William Conolly, of Cheltenham; Mr. Sands Cox, of Birmingham; Mr. David Crawford, of Shrewsbury; Dr. W. Crompton, of Birmingham; Mr. Cole, of Bewdley; Mr. Covey, of Birmingham; Dr. Birt Davies, of Birmingham; Dr. A. W. Davis, of Presteign; Mr. J. Dawson, of Liverpool; Mr. Edwardes, of Wolverhampton; Dr. Evans, of Birmingham; Mr. Elkington, of Birmingham; Dr. Feild, of Worcester; Dr. Forbes, of Chichester; Mr. Fripp, of Bristol; Mr. Fowke, of Wolverhampton; Mr. Fryer, of Bewdley; Mr. A. Fry, of Yardley; Mr. Flint, of Stockport; Mr. Fereday, of Dudley; Mr. Gill, of Wolverhampton; Dr. Goldie, of Shrewsbury; Mr. Griffiths, of Hereford; Dr. Gibson, of Birmingham; Dr. Hastings, of Worcester; Mr. Hebb, of Worcester; Mr. Hetling, of Bristol; Mr. Hiron, of Warwick; Mr. Hitchman, of Leamington; Mr. Hodges, of Ludlow; Mr. Hughes, of Stafford; Dr. Huey, of Birmingham; Mr. Ingleby, of Birmingham; Dr. Jeffreys, of Liverpool; Mr. Jennings, of Leamington; Dr. James Johnstone, of Birmingham; Mr. Jones, of Alcester; Dr. Jones, of Denbigh; Mr. G. Jones, of Henley-in-Arden; Mr. Jotham, of Kidderminster; Dr. Kaye, of Cheltenham; Dr. Kennedy, of Ashby-de-la-Zouch; Dr. Kidd, of Oxford; Dr. Loudon, of Leamington; Dr. Lloyd, of Ludlow; Dr. G. Lloyd, of Shiffnall, Salop; Dr. Luard, of Leamington; Dr. Malden, of Worcester; Mr. P. Martin, of Reigate; Mr. Middlemore, of Birmingham; Mr. P. B. Marshall, of Shepton Mallett; Mr. Morris, of Worcester; Dr. W. Moss, of Dudley; Mr. Nankivel, of Coventry; Dr. Shirley Palmer, of Birmingham; Mr. Parsons, of Birmingham; Mr. Power, of Leamington; Mr. Porter, of Birmingham; Mr. Partridge, of Birmingham; Mr. Piper, of Birmingham; Mr. Ransome, of Manchester; Mr. Rice, of Stratford-upon-Avon; Dr. Riley, of Bristol; Mr. Ryland, of Birmingham; Dr. Scott, of Liverpool; Mr. Selwyn, of Ledbury; Mr. Smith, of Southam; Mr. Sheppard, of Worcester; Mr. Soden, of Bath; Dr. Stevens, of Ely; Dr. Streeten, of Worcester; Mr. Starkey, of West Bromwich; Mr. Sanders, of Birmingham; Mr. Shelton, of Bromyard; Mr. Short, of Solihull; Mr. Turner, of Manchester; Mr. Taylor, of Birmingham; Mr. Thursfield, of Bridgnorth; Mr. Thursfield, of Kidderminster; Dr. Underwood, of Ross; Dr. Wake, of Warwick; Dr. Ogier Ward, of Birmingham; Mr. Watson, of Stourport; Mr. W. D. Watson, of Warwick; Mr. Webb, of Alcester; Mr. Wickenden, of Birmingham; Mr. Williams, of Leamington; Dr. Williams, of Banbury; Mr.

Woolfenden, of Warwick; Mr. Wood, of Birmingham; Mr. Wilson, of Manchester; Mr. Wynter, of West Bromwich; Mr. Wilders; Mr. Williams, of Bewdley; Mr. Woodward, of Worcester; Mr. Wild, of Stourport, &c. &c.; with many other gentlemen from remote parts of the kingdom.

Dr. John Johnstone opened the Meeting by reading the following remarks:

"Gentlemen,—Before I proceed to open the business of this anniversary of the Provincial Medical and Surgical Association, to which I was appointed President by that held at Bristol in the past year, permit me to thank you from my heart for the distinction and honour conferred upon me. To be deemed worthy of such a distinction is a source of inexpressible pride and gratification to me; to have it conferred when I was absent, afar off, adds, if possible, to my gratitude; and when I look round and see in this assembly men distinguished for their rank, for their talents, for their accomplishments, and for the confidence reposed in them by society, surely there is sufficient reason for exultation on my part. Nor did any occasion ever present itself more pregnant with congratulation to any society than that which is offered to us this day, when an assemblage of learned men, professors of the art of healing in its various branches, more numerous, perhaps, than was ever assembled for the same purpose before, has met, with disinterested zeal, from parts of the kingdom so remote. Yes; when we consider that we assemble, not to serve the purposes of faction—not to enhance or secure our own personal interests or emoluments—but for the end and aim of communicating knowledge to each other, and of advancing that art which, above all others, tends to promote the happiness by administering to the health and physical well-being of our species—assuredly, gentlemen, I have a right to congratulate not only you, but also our countrymen at large. The value of the services of our profession, I believe the enlightened public are not insensible to.—"The zeal, the eager spirit of investigation, the indefatigable perseverance, the self-immolation in the cause of truth, which have ever been the characteristics of it, have often received for their noble exertions in the noblest of all sciences—the science of relieving suffering humanity—the approbation and applause of admiring nations." You will agree with the author whom I have just quoted:—"It were tedious, nay, it were invidious to select instances; the respect universally paid to

medical men, is sufficient testimony of the estimation in which they are held." Gentlemen, they will find, as they have ever found, that their confidence is rightly placed; that we are still forward to experiment on ourselves; still the first to rush on danger; still the last to yield to despair. In fine, that we spend our lives in the search of those means which may best improve the imperfect condition of our race, and, by framing associations such as this, establish a co-operation, the best calculated that can be devised, to extend the limits and increase the usefulness of the healing art; for it is only by associating with our own, the knowledge of others, and, as it were, amalgamating, concentrating, piling facts together, that we can arrive at great results. All great men have become so by taking advantage of the knowledge of preceding ages; and it is the ignorant empiric alone, who pretends that he only possesses all the learning of the world. A physician who would, by his own experience alone, assume that he should become consummate in his art, would require a life of several ages to do so, besides the possession of the most sublime genius. Study, indeed, may furnish us, in a very short time, with the discovery of ages; an hour is sufficient to inform us of truths which were purchased with the care and trouble of years; but solitude, though the school of genius, is a troubled ocean; whereas the communication of knowledge in associations like ours, pours all the rivulets of information into a general stream, which fertilizes the soil through which it flows.—Of the progress of our Association, a report will now be read which must gratify your best feelings; it will speak for itself. On other passing events, which are our common concern, that great question now before the Legislature, viz. the modifications that ought to be adopted for regulating the education of practitioners, and giving the right and fixing the boundaries of practice, is too wide and too important to be discussed in a few words. There can be no doubt that qualifications should be nicely ascertained, for in the mere teaching of our art, as society is at present constituted, there is little difficulty. Every master, whether in medicine or surgery, if he is much employed, cannot fail to place that practice before the eyes of his pupil, who, with a common share of sense, and proper previous instruction, must profit by it. Moreover besides the metropolis, many of our great towns now furnish facilities for lessons in Anatomy, Physiology, Pathology, and Natural Philosophy; and to use the words of our learned and honoured friend, Dr. Hastings, the founder

of this Association,—"Everything now conspires to render the present a fit time to make our great experiment. Let us look alone to the numerous charitable medical institutions, which, to the honour of the provinces, flourish so vigorously in every direction. The means which they afford to increase our knowledge of the medical art, if they really were sanctuaries of science, as well as of sorrow, are incalculable." But, gentlemen, though great talent may surmount difficulties, we are to rely upon primary education for forming high character. Science alone is not sense; before it can be made efficient, and capable of being embodied in the intellect and character of the man, you must give him previous and early instruction; you must prepare the soil for the crop, before you sow the seed. Is it, then, classical instruction alone that you would inculcate as supremely necessary? No, not alone, certainly not alone; but it is, combined with the wide range of moral and religious instruction, the best groundwork of future judgment and higher intellect. Give the boy while he is your pupil an elevated sense (which will combine all the minor considerations) and it will stamp his future character. Prick on the ruddy stripling with high words and thoughts, and depend upon it, when his hair is grown grey, that he will illustrate his education by high deeds. There are many other topics which occur to my mind as belonging to the task of your orator, which I shall not touch upon. The future can only be imagined by the past, and that future is rich with promise; and the dark clouds which hang before it are gilded with hope. The collections of useful knowledge, the communication and comparison of facts, the clashings even of opinion, cannot fail to be precious and abundant in their produce to this meeting. It will naturally constitute a part of the task of your orator to consider the Transactions of the Association, or I should take pleasure in dilating on the merits of the papers now printed: the originality of some; the ingenuity, judgment, and sagacity of others; and the zeal and good spirit displayed in all for the promotion of science. Nor can it escape our observation, that such records, even though less elaborately prepared, may be most advantageous to science. In whatsoever station of practice a man may be, something of more or less importance may occur for him to communicate; he that cannot form a sheaf may glean an ear, and thus contribute to the general harvest. It is the endeavour we solicit and encourage. Let every man do his part, and the end we aim at will be gloriously accom-

plished. Thus, then, by mutual instruction, and by collecting together the scattered rays of medical knowledge, science will be advanced. Thus, too, will the character of its members assume a more dignified attitude, and gain a higher position in society. I do not mean the decorations and titles too often purchased by intrigue and the countenance of a court; but those higher honours of enlarged accomplishment, personal dignity, and devotion to the cause of humanity, which so often illustrate the members of our profession, and win the confidence of society. Nor are such associations as these of trifling consequence to ourselves morally, by bringing the remote members of a learned profession together, and making them known to one another. Distance mystifies and disguises objects; often exhibits them in false colours, or of unnatural dimensions; and hence is often productive of wrong estimate and misconception. On the other hand, proximity makes them more clear, and dissipates the doubts which gave rise to error: for who has not felt prejudice extinguished by nearer view; by eye beaming on eye; voice answering to voice? Who has not felt animosity appeased by the tone and look of kindness? Let the meetings of our Association become a solemn league and covenant, binding the members together in goodwill and faith; and thus, while our studies and pursuits bear healing on their wings, we shall be more disposed to treat each other with affection and consideration; to bear and to forbear; even when malignantly assailed, to cast aside resentment, and listen to the accents of peace.

> Tu que prior, tu parce, genus qui ducis Olympo,
> Projice tela manu."

REPORT OF THE COUNCIL, 1834.

The Council, in resuming the annual duty which devolves upon them, of submitting to the General Meeting an outline of the proceedings of the past year, beg, in the first place, to offer their sincere congratulations on the progress that has been made by the Association, in the pursuit of those objects which have, from its commencement, engaged the attention of its members.

As a circumstance which demands from the Council a primary consideration, they will allude to the number of members; and in this respect they find abundant proof of the progressive growth of

the Association. At the termination of the second year of its establishment, the Association can boast of no less than four hundred and fifty members; whereas, when the report of the Council was made to the last annual meeting, the number was only three hundred and sixteen.

In consequence of the whole of the subscriptions not having been paid up, and of the greater expense of publication this year, arising from the plates being of a superior and expensive kind, and the increased size of the volume of Transactions, the balance in the Treasurers' hands is not so great as it was last year; but there is no reason, on this account, for any apprehension that the income, in future, will not be equal to the expenditure. The receipts, during the past year, amount to £410 12s. 6d.; while the expenditure is only £374 7s. 10; leaving a balance of £36 4s. 8d.

It is matter of great satisfaction to the Council, that the second volume of the Transactions contains a still greater number of valuable papers than the first; and they feel assured, that every friend of the Association will rejoice that so many of its members have already devoted their time and talents to enrich its Transactions; since the favourable impression which has been made by these communications, upon the conductors of the public medical press, cannot fail to elevate the character of the Association, and, thereby, widely to extend its influence in the improvement of the healing art.

It gave the Council great pleasure, to find that the anniversary meeting of last year confirmed their recommendation respecting the propriety of reports on the distinct branches of medical science; and, anticipating that the gentlemen who undertook to make those reports, will deliver them to the meeting at Birmingham, they will propose that, at the following anniversary meeting, there be presented separate reports on the Physiology of Alimentation; on the Pathology of Dropsy; and on the Rise and Progress of Provincial Medical Schools.

The Council have not been inactive in carrying into effect the resolution of the meeting at Bristol, with respect to the appointment of honorary corresponding members; and by the recommendation of the members appointed for foreign correspondence, the names of several eminent individuals in Germany, Switzerland, Holland, Belgium, and Spain, have been placed on the list. Two of the members appointed as foreign correspondents having declined

to take the office, it became necessary for the Council to make a new arrangement; and they are happy to announce that Dr. James Clark has undertaken to correspond with France, Germany, Switzerland, and Belgium; and they expect that, at the anniversary meetings, important information will be communicated from those countries. A paper has been already received from Dr. Nieuwenhuys, of Amsterdam; and a valuable statistical document from Mr. Scott, Colonial Surgeon, at Van Diemen's Land.

The contributions to the fund for the establishment of a Prize Essay, have not, hitherto, been to any great extent; but three liberal donations have been received towards it: one of twenty-five pounds, from Dr. Thackeray, of Chester; another of ten pounds, from Mr. Jennings, of Leamington; and another of five pounds, from Mr. Gwynne Bird, of Swansea.

The Council think that it would be desirable to appoint some honorary members; and they submit for consideration the names of Sir A. Cooper, Bart., Sir Chas. Bell, Knight, and Dr. Abercrombie, of Edinburgh.

It becomes the duty of the Council to allude to the proposals which were submitted by Dr. Baron, to the meeting at Bristol, for the establishment of a Library, and of a Medical Benevolent Charity, in connection with the Association. With regard to the Library, several members have expressed themselves in favour of this proposition; but the Council consider that the details would be too complicated to bring before a general meeting, and, therefore, suggest the propriety of appointing a Committee to inquire into the practicability of the proposal, and to report upon it to the Anniversary Meeting at Oxford. The proposal for a Medical Charity, has also been favourably received by some members; which induces the Council to recommend that a Committee be also appointed to take this subject into consideration. A charity of a similar description to that proposed by Dr. Baron, has for some years existed at Birmingham, and has met with considerable success. Several of the directors of that society seem not unwilling to extend its benefits to the members of the Association; the Council, therefore, think it very desirable that the above Committee should be empowered to confer with the directors of the Birmingham Medical Benevolent Society, and report the results to the Anniversary Meeting which will be held at Oxford in 1835.

In consequence of the loss sustained by the Association, in the death of Dr. Darwall, it became necessary for the Council to appoint some other gentleman to deliver the Address; and they trust that, in fixing upon Dr. Conolly, of Warwick, who had long been the intimate friend of the deceased, to undertake that important duty, they have pursued a course alike respectful to the memory of Dr. Darwall, and gratifying to the members of the Association.

The Council would recommend that, in towns where many members of the Association reside, occasional meetings of such members should take place, for the promotion of the general objects of the Association, namely, the free communication of professional knowledge, and the cultivation of good feeling among the members. The rules for such sectional meetings being left to the consideration of the respective parties.

The Council cannot conclude their report, without again reminding the members, of the necessity of continuing those exertions which have already secured to the Association a degree of prosperity which few institutions have so early attained. They beg also to suggest, that it is only by zealous perseverance in the cause in which they have so auspiciously engaged, that they can expect progressive advancement in their career of usefulness. Let, then, each member of the Association feel himself called upon to support the reputation of the body of which he forms a part, by using his utmost endeavours in the promotion of its interests, and the Association will then undoubtedly flourish in still greater vigour, while at the same time a rich harvest of professional knowledge will reward its labours.

CHAS. HASTINGS, } Secretaries to the
J. P. SHEPPARD, } Association.

It was then moved by Dr. Booth, of Birmingham, seconded by Dr. Evans, of Birmingham,

That the Report of the Council now read be approved and adopted.

Moved by Dr. Kidd, of Oxford, seconded by Dr. Johnstone, of Birmingham,

That the thanks of the meeting be given to Dr. Conolly for his eloquent address, and that he be requested to allow the same to be printed.

Moved by Mr. Baynham, of Birmingham, seconded by Mr. Dawson, of Liverpool,

That the Anniversary Meeting for the year 1835, be held at Oxford, and that Dr. Kidd be requested to accept the office of President-elect.

Moved by Dr. Barlow, of Bath, seconded by Dr. Forbes of Chichester,

That the thanks of the Meeting be given to Dr. Carrick, the late President, and that he be appointed a permanent Vice-President.

Moved by Dr. Malden, of Worcester, seconded by Dr. Jeffreys, of Liverpool,

That the thanks of the meeting be given to Dr. Hastings and Mr. Sheppard, the Secretaries of the Association, and that they be requested to continue their services.

Moved by Dr. Carrick, of Bristol, seconded by Mr. Watson, of Stourport,

That the Council for the last year be requested to continue their services, with the following additional members, and that they be empowered to add to their number:

Dr. Booth, of Birmingham,
Dr. James Johnstone, Ditto.
Dr. Evans, of Birmingham.
Mr. Wood, Ditto.
Mr. Baynham, of Birmingham.
Mr. Wickenden, Ditto.
Mr. Middlemore, Ditto.
Mr. Parsons, Ditto.
Dr. Daubeny, of Oxford.
Mr. Fripp, of Bristol.
Mr. W. Sands Cox, of Birmingham.
Mr. Norman, of Bath.
Mr. Gore, Ditto.
Dr. Watson, of Bath.
Mr. Ormond, of Bath.
Mr. Tudor, Ditto.
Dr. Luard, of Leamington.
Mr. Williams, Ditto.
Dr. Wake, of Warwick.
Dr. Holme, of Manchester.
Mr. Addison, of Malvern.
Mr. Edwardes, of Wolverhampton.

Moved by Dr. Luard, of Warwick, seconded by Mr. Hebb, of Worcester,

That Dr. Prichard, of Bristol, be requested to deliver the retrospective Address at the Anniversary Meeting for 1835.

Moved by Mr. Hetling, of Bristol, seconded by Mr. Soden, of Bath,

That the thanks of the Meeting be given to Mr. Turner for his valuable Report, and that he be requested to publish the same in the Transactions of the Association.

Moved by Dr. Lomax Bardsley, of Manchester, seconded by Dr. Goldie, of Shrewsbury,

That the following Members be a Committee to take into consideration Dr. Baron's proposal for forming a Library, and Report thereon to the next Anniversary Meeting:—

Mr. Wickenden, of Birmingham.
Mr. Parsons, Ditto.
Mr. Baynham, Ditto.
Dr. Baron, of Cheltenham.

Moved by Mr. Ransome, of Manchester, seconded by Dr. Streeten, of Worcester,

That the following Members be a Committee to take into consideration the practicability of connecting a Benevolent Society with the Association, and that they be requested to confer with the Birmingham Medical Benevolent Society, with the view of extending the benefits of that Society to the Members of the Association, and that they communicate the result to the next Anniversary Meeting:

Dr. Jeffreys, of Liverpool.
Mr. Wickenden, of Birmingham.
Mr. Wilson, of Manchester.
Dr. Baron, of Cheltenham.
Mr. Ransome, of Manchester.
Dr. Evans, of Birmingham.
Dr. Booth, Ditto.
Mr. Williams, Ditto.

Moved by Mr. Wickenden, of Birmingham, seconded by Mr. Selwyn, of Ledbury,

That Sir Astley Cooper, Bart., Sir Charles Bell, Knight, and Dr. Abercrombie, of Edinburgh, be appointed Honorary Members of this Association.

Moved by Dr. Scott, of Liverpool, seconded by Mr. Addison, of Malvern,

That the thanks of the Meeting be given to Mr. Jennings, for his excellent Report, and that he be requested to print the same; and thanks also to Dr. Streeten, for reading the above Report.

The Report upon Vaccination was then enquired for, but Dr. Malden, on behalf of the Committee, explained that they were not prepared with their Report, as the subject was a very wide one, and required much time and labour for its investigation. The Committee, however, hoped to be prepared next year.

Moved by Dr. W. Conolly, of Cheltenham, seconded by Mr. Hughes, of Stafford,

That Dr. Malden and Dr. Streeten, of Worcester, be requested to draw up a Report on the Physiology of Alimentation, and present it to the next Anniversary Meeting.

Moved by Dr. Phillips Jones, of Denbigh, seconded by Mr. Griffiths, of Hereford,

That Dr. Booth and Dr. Evans, of Birmingham, be requested to draw up a Report on the Pathology of Dropsy, and present it to the next Anniversary Meeting.

Moved by Mr. Wilson, of Manchester, seconded by Mr. Smith, of Southam,

That Dr. Conolly, of Warwick, and Mr. Hetling, of Bristol, be requested to draw up a Report on the Rise and Progress of Provincial Medical Schools.

Moved by Mr. Middlemore, of Birmingham, seconded by Mr. Crawford, of Shrewsbury,

That the thanks of this Meeting be given to Mr. Hebb, for the trouble he has taken with Dr. Nieuwenhuys' communication.

Moved by Dr. Hastings, seconded by Mr. Morris, of Worcester,

That the thanks of this Meeting be given to the Sanatory Institutions, to the School of Medicine, to the Philosophical Institution, to the Conductors of the Botanic Garden, and to Sir Edward Thomason, of Birmingham, for the facilities and accommodations afforded to the Association on this occasion.

Moved by Dr. Conolly, of Warwick, seconded by Mr. Flint, of Stockport,

That the thanks of the Meeting be given to our excellent and enlightened President, for his conduct in the chair.

AN

ADDRESS

DELIVERED AT THE

SECOND ANNIVERSARY MEETING

OF THE

PROVINCIAL

MEDICAL AND SURGICAL ASSOCIATION,

JULY 18th, 1834.

BY JOHN CONOLLY, M. D.

In the address delivered on the occasion of our meeting last year,* there exists an example which, whilst it may serve to direct the course of all who attempt the same duty, yet occasions much solicitude in my mind at this moment, from the consciousness which I feel that it must be with unequal steps that I follow the able and distinguished physician by whom the duty was then performed. But whatever anxiety I may feel on this account, is largely mingled with the inexpressible sorrow with which I reflect that I stand here as the representative of a most valued friend who is no more, but whose talents, whose knowledge, and whose estimable character,

* By Dr. Barlow, of Bath.

would have given far greater weight to all that he would this day have delivered to us.*

The retrospect designed at these annual assemblies, does not, I apprehend, imply a notice of every new or revived suggestion, of every opinion yet the subject of examination or of controversy, nor even of every new publication which the past year has brought forth. So discursive a view would be tedious, if not unprofitable: and it seems better to take one more general, and to touch on the chief circumstances which, in the performances or in the endeavours, in the literature or in the practice of the time, serve to fix the present era, to shew its predominant tendency, or to mark the advancement ever making, however slowly and by whatever obscure paths, towards just principles of medicine and of surgery.

In the department of medicine, although there is a constant movement, the retrospection of one year can only comprehend a few of the particular instances by which progression is indicated: but it may be generally observed, and I esteem it a just matter of gratulation, that all the present efforts of our profession, and most or all of the valuable medical works recently published, or in the course of publication, and those by which the present day is, I should say,

* It must be well known to most of the members of the Association, that the task of delivering this address was assigned to me after the death of the late Dr. Darwall, of Birmingham, by whom it had been undertaken. Its preparation was among the subjects of almost the last conversation which his distressing and fatal illness permitted him to hold with me, and his intention was that it should include a survey of the Revolutions of Medical Theories, a topic demanding extensive erudition and great judgment, but for the management of which he was eminently fitted, both by his natural capacity and by his acquirements.

characterised, have a direct tendency to diffuse over the whole professional body that full, minute, and exact pathological information which was, until a recent period, almost inaccessible to persons residing remote from the capital. I consider this as promising the greatest possible advantage to the public: it is in accordance with the spirit of an age which, if not free from many human errors, is most certainly distinguished, beyond all preceding ages, by a general thirst for every kind of laudable knowledge.

Emulating the zeal of our continental brethren in separate branches of enquiry, and led into great general views by the labours of Bichat, Meckel, Andral, and the many illustrious men who have adorned or who adorn our profession, in Germany and in France; if we must admit that we are unequal to them as regards the number and value of monographs on separate diseases, we may satisfactorily point to the admirable works, more general in their character, and illustrative of morbid and of healthy structure, now publishing, by Dr. Bright, by Dr. Carswell, and by Dr. Hope; to the anatomical illustrations of Dr. Quain; and to Mr. Swan's unrivalled plates of the nerves; as works which will bear a comparison with any that have appeared in any country. The great anatomical work of Cloquet, and the pathological anatomy of Cruveilhier, indicate a similar progress among our neighbours; and in our own country the anatomical and physiological work of Mr. Kiernan on the liver, Dr. Roupell's illustrations of the effects of poisons, the drawings from the collection of morbid anatomy at Chatham, and those from the museum of the college of surgeons, in London,

deserve particular mention, as indicating the inquiries pursued at this time, or the increased means of study and improvement.

The Cyclopædia of Practical Medicine, of which such honourable mention was made in the last year's Address, has now nearly reached its conclusion; and a Cyclopædia of Physiology is already announced, the precursor, probably, of a similar compendium of modern surgery, of all which undertakings the general result will be that to which I have already alluded, the spreading of that kind of knowledge very extensively which, leading to practical improvement, will benefit the whole community. Of the Editors of the Cyclopædia of Practical Medicine, I believe I may truly say, that the responsibility of an undertaking of that extensive nature, and the influence which it might exercise on the younger portion of British practitioners, have never been absent from their minds.

In the particular study of diseases of the brain, of the chest, and of the abdomen, all must acknowledge how much we owe to foreign cultivators of medicine, and in an especial manner to the scientific and indefatigable physicians attached to the Parisian Hospitals. The translation of their works has conferred extensive benefits upon us: that of the treatise of Laennec, by Dr. Forbes, has done more, I venture to say, to promote an exact acquaintance with diseases of the lungs and of the heart, than any book which ever appeared; and the actual preparation, at this time, of a third edition of it, is a proof of the avidity with which English readers have availed themselves of its assistance. It is, indeed, evident,

that some of the best modern treatises both on the pathology and physiology of the heart and lungs, have been suggested by the observations of the great auscultator.

There is still another department of medical study and practice in which the French have done much, and we have done little. In the clinical study of mental disorders, no advance can be reported; it is yet entirely overlooked in English medical education. Lectures are delivered, and treatises are written, but practical observation is limited to the officers of institutions for the insane. Hospitals for lunatics are closed to the student, and the knowledge of mental affections makes little or no progress. As a consequence of this, not a year passes without some notorious case of insanity being brought before the public, in a manner reflecting little credit on the conflicting medical authorities; whilst instances of the injudicious or improper confinement of patients are not unfrequent, and such as neither the visitors of asylums, nor the Metropolitan commissioners of lunacy, nor the Lord Chancellor, are found to have, or to exercise, any power over. To the same negligence of this whole subject, it must be attributed that we have so few aids to a knowledge of the conditions of the brain in the various forms of insanity, that the pathology of insanity is so uncertain and incomplete, and the treatment so generally empirical. Our larger lunatic establishments have contributed little or nothing to our knowledge, and in many of the private lunatic houses, there is too much reason to fear that therapeutic measures still obtain very little attention. When the public establish-

ments are made, as under proper regulation they might be, schools of instruction, we shall learn how much our practice in these distressing disorders may be improved. The phrenologists have attempted, without much encouragement, to throw some light on the causes of insanity; but, although the truth or error of their opinions on this subject is closely connected with the most interesting speculations that can employ the reflective powers of man, their views have in very few instances been examined in a philosophical spirit, or, indeed, with candour, either by physiologists or pathologists. There is reason to hope that as a result of the humane and enlightened management of the large lunatic asylum at Hanwell, under the superintendence of Dr. Ellis, this branch of practice may hereafter be more satisfactorily spoken of.

The will of an eccentric nobleman has, within the last and the preceding year, led to the publication of several valuable treatises, forming what is called the Bridgewater series, and which, although they appear when the popular proofs of a Divinity have already, by the admirable work of Paley, been made familiar to most readers, have yet been the means of our acquiring, (particularly in those of Sir Charles Bell and Dr. Kidd,) delightful books on subjects closely connected with our professional studies, and well calculated, among other ends, to attract general readers to such an acquaintance with the structure and functions of the human body as would, better than any legal enactment, secure them from the dishonesty, and the profession of medicine from the disgrace, of pretenders to medical science, who thrive

by, and exult in, the ignorance and credulity of mankind. Even as regards proofs of design and intelligence, the novelty, variety, and beauty of the examples, drawn by so many highly-gifted writers from the rich stores of modern science, make the Bridgewater treatises instructive to most readers, and interesting to all. Some of the treatises seem more exclusively addressed to scientific readers; as that of Dr. Prout, a work worthy of the established reputation of its author, and in which he has embodied much of the wisdom accumulated in a life devoted to philosophy, in a form and with an arrangement which leads his readers through pleasant paths, scattered with the finest and most recondite facts of science, to the most enlarged contemplation of man's nature and destiny.

The study and practice of surgery appears, like that of medicine, to be advancing with slow and cautious steps, but in a right direction. Its cultivators seem, in our day, to be less anxious to produce dazzling results than to pursue the most prudent measures for relieving all the diseases, and all the serious accidents, which require their attention, with as little as possible expense to the constitution or disfigurement of the bodily frame. Very persevering efforts have been making both in this country and on the continent, to lessen the external, as well as internal, ravages of scrofulous disorders; and the claims of iodine as a valuable addition to our means of controlling some of the effects of that prevalent malady, which were at first too strongly advanced, and then, as generally happens, too much disregarded, seem now to be established. The medical

as well as surgical use of this medicine, and of the strychnia, are among the most interesting of the practical experiments now making by physicians and surgeons; the one in the disorder just mentioned, and the other in some forms of paralysis.

But the leading events in surgery during the past year, have been the operations performed in town and country, termed lithotrity or lithotripsy, for breaking down calculi within the bladder, and removing the fragments through the urethra. These attempts have been regarded by surgeons in general with great attention, and reflected upon with impartiality. Its most zealous supporters, among whom we must place the Baron Heurteloup, who has honoured me with a late communication on the subject, avow that there are yet several difficulties to be removed by experience and ingenuity, in order to make the operation applicable to a wide range of cases; and that the facts already collected, although numerous, are insufficient to enable us to make a full estimate of its advantages over lithotomy. All will concede, I believe, that in the early stage of a calculus, in an adult subject, the new operation offers a reasonable hope of benefit, and with little or no risk. When organic disease of the containing, or adjacent, or connected viscera coexists with calculus, then, not only lithotripsy, but lithotomy, has disadvantages and even dangers. If I may venture to express an opinion from having, in the course of last year, seen the operation several times repeated by one of the members of this Association, Mr. Welchman, of Kineton, in a case which proved by no means favourable for it, but still with a self-possession and

ability which did the utmost credit to the operator, I should say that few operations require such carefulness on the part of the surgeon, and in none is the perfect temper of the instrument he employs a matter of such momentous import. These circumstances would seem, with others that I need not specify, to justify the opinion of Baron Heurteloup, that the single operation of lithotripsy demands the practitioner's exclusive attention. Mr. Costello, however, who has most kindly sent me several details of his own experience, entertains different views. He has witnessed the several operations required in more than two hundred cases subjected to lithotrity; he has performed the operation on patients of seven or eight years of age, and of eighty-four years. Of ninety-seven cases of stone submitted to him since he became a resident in London, he rejected but sixteen as unfit for the operation: and of the eighty-one operated upon, sixty-six were treated successfully, eleven have died under treatment, and four have remained unrelieved.* All the fatal cases were examined after death, and in all, the stone was found somewhat acted upon, whilst, in most of the cases, there were pre-existing organic lesions of the bladder or the adjacent parts. After this ample experience, which must have acquainted Mr. Costello with every variety of difficulty likely to be encountered, he still zealously maintains that the operation may be made familiar to the profession,

* In the Necker Hospital of Paris, of 51 cases of calculus, 43 were operated upon by M. Civiale; 27 were cured, 10 died, and 6 remained unrelieved. In the other 8 cases, lithotomy was performed; 5 died, 3 recovered. M. Leroy D'Etiolles has been more successful; of 15 cases operated upon by him, the success was complete in 14.

and abates in no degree from his personal efforts to demonstrate and explain it in the different provinces. I cannot but concur in this opinion. There is no difficulty which the energy and ability of British surgeons cannot overcome; and whatever benefits lithotrity can confer on patients, will, I doubt not, in a few years more, be no less generally secured to them than those of the capital operations heretofore performed by the celebrated surgeons both of the metropolitan and country hospitals.

In the medical periodical literature of this country, which exercises considerable influence on the whole profession, few recent changes have taken place. We may observe that, for the most part, such publications are devoted to the useful but unambitious task of making abstracts or selections from new works, for the benefit of hasty readers, or of those not likely to see the originals: an office which, upon the whole, they perform with ability and fairness. Whatever objections may exist to such a plan, it evidently leads to the ready circulation of much professional knowledge throughout the world. Some of our journals are more strictly chronicles of passing events; and such seem particularly required at a time when questions of medical polity are daily discussed. If not altogether free from personalities and illiberality, this portion of the medical press is yet, for the most part, conducted with much intelligence, and by men of integrity and honour. The Quarterly Journal of Medicine is to be noticed as a new publication, and it sets out with considerable claims in the department of *critical* writing, in which English medical journals have been generally defective. The

long established Medical and Surgical Journal of Edinburgh, associated in the minds of so many readers with their earliest studies, still maintains, especially in its critical notices, the high rank which it has so long possessed.

The Provincial Medical Schools formed or forming in different parts of England, present to our regards institutions destined to effect great changes in the condition of our profession. They have arisen out of the increased diffusion of medical knowledge, which, in turn, they will powerfully promote. Every year adds to their number, and to the qualities which promise them durability. The Pine-street school of medicine and surgery at Manchester, was established in 1824.* The names of Bardsley and Turner, the lecturers on physic and anatomy, sufficiently testify its very respectable character. More than two hundred pupils have been educated at it; and a second school has subsequently been established in the same town. Clinical instruction is given at the Infirmary, in which relief is annually afforded to more than 19,000 of the sick and poor. The Bristol school, and that of Birmingham, were established in 1828. The merits of the latter are too well known to many of those now present, to require any other observation from myself, than that I view with unfeigned satisfaction the progress of such an institution, and of its library and museum, so worthy of the town in which science is applied to some of the most

* Anatomical lectures were delivered at Manchester for many years previous to that time, and with great ability, by Mr. Jordan. In the Report on Provincial Schools, to be presented at the Meeting of the Association at Oxford, in July, 1835, their origin and progress will be more particularly spoken of.

beautiful productions of art, and of which all the rising institutions bespeak an elevated conception and a growing refinement; a town which, not to mention those living characters who confer celebrity upon it, has enriched our philosophical annals with the names of Priestley and of Watt, and those of our own profession with those of Withering and of Freer. The advantages enjoyed by the medical students at Bristol are more than I can here enumerate, but such as may be conceived in a town possessing a large scientific institution, a noble infirmary, and most favourably situated for the prosecution of the natural sciences. Neither can I do more than allude to the medical school of Sheffield, opened in 1829, by Dr. Knight, in an address equally remarkable for its elegance and the valuable observations it contains on the subject of medical education and the medical character. Schools have also been formed, some of them very recently, at Leeds, at Liverpool, at Hull, at Exeter, at Norwich, at Nottingham, and probably in other towns. Of some of those which I have mentioned I have been furnished with several particulars, but the details are so numerous as to require, and so interesting as to deserve, a separate Report, as contemplated by the council.

Passing by the comparative merits or disadvantages of the London and Provincial Schools, which are sufficiently obvious, no one who knows the character of provincial physicians and surgeons, can doubt their efficiency, with the advantage of the County Hospitals, as conductors of professional education. We know, in fact, what able lectures are

now delivered in the country, with what care anatomy is cultivated, and that museums are gradually forming, which, in point of real utility, will soon rival the collections of the smaller Continental capitals, some of which have long been, or are, the seats of celebrated schools, and rendered illustrious by the formation of great men, and by immortal discoveries.

To those acquainted with the pleasures and advantages of scientific pursuits, a country residence is often rendered distasteful by the supposed want of opportunities of improvement. The medical schools will be so many centres of scientific information, furnishing every help to the prosecution of botany, chemistry, and other sciences auxiliary to medicine, and even of every branch of natural history. To those already engaged in practice, no reflection is more familiar, or more depressing, than that of being removed from the means of further improvement: the impressions made in past years fade in the memory, and we dread the loss of what we acquired with care. In these Provincial Schools we see a delightful prospect of new fountains of knowledge, to which we may all have recourse from time to time as long as we live.

That the survey of a single year offers no striking addition to medical or surgical knowledge, the promulgation of no theory claiming a general assent, nor even any remarkable addition to the resources of our art, is, perhaps, to be considered as proving the philosophical manner in which that art is now practised. In the present state of our education, we acquire a great distrust for theories, and a great respect for facts; and whilst theories may be quickly

formed, facts can be but slowly established. The great body of practitioners may be said, at this time, to be engaged in a constant course of quiet and unobtrusive clinical observation, and as thus approaching, by a combination of cautious theory and considerate practice, to the establishment and security of our practical knowledge, and to an exact acquaintance with the powers and prospects of medicine.

Moreover, it seems at length to be seen, that we wrongly expect to find for each disease a remedy, or, as it were, a specific compensation in nature, as for some inevitable evil; and that, in fact, some of the worst and most devastating diseases are the results of men's ignorance, and to be remedied by their advancing knowledge; or the product of men's selfish passions, seconded by power, and to be swept away by the greater power of better information imparted to all classes of human beings.

Thus is constituted a close connection between the medical art and the subjects of Statistics and Medical Topography, subjects long neglected in England, but now beginning to attract that attention which they deserve. In this department the pages of our Transactions promise to become a treasury of knowledge.

One of the effects of the dreadful epidemic which has, within the last few years, ravaged Europe, has been to call the attention of communities more strongly to a consideration of the circumstances which promote health or dispose to disease. The movements of the cholera, often mysterious, were sometimes evidently influenced by the neglected

state of particular districts: it was often plainly seen to be invited or fostered by poverty and wretchedness, by improvidence and depravity. In almost every town and city which it visited, the first abodes into which it entered were those of the destitute, or of the abandoned and dissolute. It is stated in a Mémoire read to the French Academy, by M. Villermé, (in April) that during its awful prevalence in Paris, the number of the sick and dead was constantly found to increase in the direct ratio of misery; and also that the greater immunity of those living in clean and comfortable houses, was more remarkable in the beginning of the epidemic than after it had made good its entry into the crowded capital. In the quarter of Paris which takes its name from the Tuileries, the sick were only as 1 in 110, and the deaths were only as 1 in 193. In the quarter called Vendôme, in which many dissipated work-people reside, the sick were as 1 in 29, and the deaths as 1 in 115. Even in the quarter of the Hôtel-de-Ville, of which the inhabitants are chiefly industrious work-people and artisans, the mortality was considerable. That portion of the town is in the old city of Paris, the houses are damp, the alleys are long and dark, the courts are wet and filthy, and the windows of many of the houses are not made to open. But in the quarter of Paris called the Cité, wherein many apartments are to be found having no light but what is received from a small court, through small windows of oiled paper, and in which the air is so offensive, that the officers of police have sometimes been nearly suffocated on visiting them, and which, also, are inhabited by the most depraved class of persons;

in this unhappy quarter the number of sick was as 1 to $4\frac{1}{2}$, and of dead as 1 to $8\frac{1}{2}$ of the population of the district! These are surely most instructive facts, and interesting not only to the pathologist, but to the legislator, and to every friend of man.

Medicine has already done too much for mankind to allow us to despair of greater benefits ensuing from continued investigation. Some of the most terrible scourges of the earth have been mitigated or removed; the numerous evils of malaria; scorbutus, which destroyed so many valuable lives; variola; and many terrible forms of pestilence, have been brought directly under man's dominion; and the general health of communities, and the length and value of life, are known to have been much increased.* Fully to appreciate all the blessings which these changes imply, or have accompanied, a man should have lived in two different ages; in a crowded, damp, ill-regulated city, such as was London in the 17th century, when the state of private houses, and the personal habits of the citizens, invited all the desolating horrors of the plague, before which 60,000 persons, or nearly a fourth part of the population then living within the bills of mortality, were swept away in one year, (1665):—and again in that splendid metropolis of the 19th century, over which the Asiatic cholera has passed, almost without leaving any traces of its power; and in which the plague is a form of malady quite unknown, or only approached in the varieties of fever still often prevailing in the worst courts of the worst parts of the town.

* The mortality in London in 1750 was 1 in 24; in 1800 it was 1 in 32; in 1820, 1 in 40.

Yet much remains to be done. Communities are not yet freed from many evils which philanthropy, which sound policy, dictate that we should not disregard. The condition of the labouring population should be raised by a more extensive exertion than is required to afford mere eleemosynary relief; and large classes of men, made in the image of their Maker, yet sleep in the dust of ignorance, the prey of wretchedness, and the victims of diseases which man's further efforts and more improved understanding will vanquish. If we contrast the condition of some of the Swiss cantons, of which the climate is by no means genial, with some portions of the Russian population, we find that, whilst in a district of the higher Alps, (Leysin), the deaths are only 1 in 60, and the mean duration of life is 56 years, in the Russian district the deaths are 1 in 25; and that whilst in Montreux, in the Canton de Vaud,* 4-5ths of those born reach the age of twenty; in the Russian diocese of Novogorod, of 1000 baptised, 661 perish before the fifteenth year.†

France exhibits an example, in one province, that of Normandy, of a people distinguished, like the Swiss, by forethought and prudence; and of all the provinces of France this furnishes, at all times, the

* The Canton of Vaud, one of the largest and most populous in Switzerland, is also the one in which the blessings of knowledge and education are most diffused. Crimes are of very rare occurrence.—Simond's Travels in Switzerland, quoted by Malte-Brun, *Universal Geography.*

† Of 10,000 children born in England, 6090 attain the age of 20 years; 5075 reach the age of 40; and 3643 live to the age of 60. This calculation was previous to the late census.—Carlisle Table.—Dr. Heysham. (From an article in the Edin. Rev. Mar. 1829. By Professor Maculloch.)

highest proportion of force to the state; and the rate of taxation borne by its prosperous and healthy peasantry, is the *maximum* of the kingdom.* The population of Normandy increases slowly: whilst that of the rest of France doubles in 117 years, that of Normandy doubles only in 398 years, and it consequently never has a great proportion of infants and short-lived persons. As a contrast with this, if we look to another part of the world, we find in Mexico, in Guanaxuato, a town containing more than 70,000 inhabitants, flourishing principally by its silver mines, that the births are as 1 in 15, and the deaths 1 in 19; a generation being destroyed in nineteen years; and, consequently, the number of healthy, adult, useful subjects, those which are wealth to a state, bearing always a small proportion to the whole.†

We may even mention the known diversities exhibited in our own population returns; the number of registered deaths being, in some parts of Wales, and in some years, not more than as 1 in 90 to the population; the average of the county of Cardigan, for

* Foreign Quarterly Review, No. xxvi.

† According to M. Moreau de Jonnes, the Mortality

In the Roman States, Old Venetian Territories, Greece and Turkey, ...	is 1 in 30
——— Low Countries, France and Prussia,	... 1 in 39
——— Switzerland, Austria, Spain and Portugal, ...	... 1 in 40
——— Russia and Poland, ...	... 1 in 44
——— Germany, Denmark and Sweden, ...	... 1 in 45
——— Norway, ...	... 1 in 48
——— Ireland, ...	... 1 in 53
——— England,.....	... 1 in 58 (It is 1 in 50)
——— Scotland,.....	... 1 in 59
To which we may add Wales,.....	... 1 in 63 (Popul. Ret.)

ten years, being but 1 in 80, or including the unregistered, 1 in 66; whilst in Middlesex it is 1 in 43, or including the unregistered, 1 in 39

The profound study of the causes of these contrasts, for the causes are not in each instance obvious, may worthily occupy the minds of statesmen and of men of science. Modern governments, less devoted to the arts of destruction, do not disdain to entertain such questions, and no persons are so likely to throw light upon them, as those who are guided by a knowledge of all the influences to which man's frame of body and mind responds.

In the new regulations of the medical profession, which have undergone much recent discussion in the French Academy of Medicine, (Projet de Loi relatif à l'organisation de la Médecine), the 16th article provides for *collecting and arranging facts and observations touching Topography and Medical Statistics in each department; and for promoting vaccination:* the 17th article prescribes *that the medical constitutions should be noted, in order to afford the government requisite information in epidemics, and to advise the public.* Among the prizes for the present year, in the Faculty of Medicine of Paris, is the Monthyon prize of 400 francs, the condition attached to which is, *that every year a memoir shall be addressed to the Faculty of Medicine, on the predominant maladies of the preceding year, the characters and symptoms of those maladies, the means of curing them, &c.* The recommendations of the British Association for the advancement of Science are copious on the subject of meteorology, and the same direction, I observe, is given to enquiry, by

the subject proposed for the prize essay of 1835, in the Harveian Society of Edinburgh, which is, *the Influence of Atmospheric Pressure on the Animal Economy;* a subject not very remote from that of the *admixtures* incidental to the atmosphere, which derive a great—I had almost said an *awful* interest, from such admixtures, apparently of gaseous bodies, sometimes forerunning seasons of great sickness, as did the remarkable haze or "dry fog" of 1782, which extended all over Europe, and which, for a time, no changes of weather affected: but a recent example, not obvious to ordinary sensation, and yet real and undeniable, exists in the fact observed by Dr. Prout, of a slight, but sensible and continued, increase of the weight of the atmosphere, at the time of the appearance of cholera in London, in 1832.

It may be permitted to me to congratulate the founders of this Association, that their comprehensive plan has, from the first, embraced, in one design, all these great questions, and that it is proposed to elucidate them without the patronage or aid of power, and simply by the industry and intelligence of the members who compose it.

When we consider these designs, engaging so many of the most powerful and active understandings of our time, and in connection with the formation, in the same year, of a Statistical Society in London, and of Natural History Societies in the country,—with the Commission lately sent out to enquire into the state of Medical Charities in Ireland, —with the attention the same subject is obtaining in England,—with the Societies forming for securing annuities to persons of the working class,—with the

arrangements by which the labouring poor are enabled to cultivate supplies of wholesome vegetable food for their frugal tables,—with the Commission issued for enquiring into the condition of our manufacturing population, and the Parliamentary enactments consequent thereto,—with the daily increasing schools, institutes, libraries, and all other means of conveying every kind of knowledge to every class of men,—and with the great and enlightened designs of the British Association of Science, which may be said to superintend and promote the efforts of all the thinking minds in the kingdom,—the view of such vast simultaneous exertions, having for their objects, among others, to lessen the causes of disease, and to improve the comfort and increase the happiness of mankind, makes us discern, amidst the errors and passions of human societies, the hand of the Divinity guiding all the proceedings of men, and finally directing the efforts of human faculties to the averting of the worst evils incidental to our unimproved nature.

These subjects cannot be mentioned without reminding us of a circumstance most honourable to our profession. To whatever portion of this empire, to whatever country or corner of the globe we turn our attention, we find its members not only much engaged in gratuitous services to the poor and distressed, but conspicuous in that work of larger charity—assisting to remove the clouds of ignorance from all minds. There are few provincial towns of our own country in which the medical residents are not the most zealous promoters of scientific and literary institutions, and it may be said that the

medical profession is creating a title to public gratitude, by promoting every kind of liberal learning, only second to that of the first restorers of learning to the oppressed and darkened world. And how elevating is the reflection that we desire nothing, as a profession, which is selfish or exclusive; that we build our hopes of distinction on the *increased* intelligence of those who are to be our judges. Whatever misgivings may haunt the minds of other classes of men regarding the effects of knowledge, when generally diffused, the medical philosopher can have none. He clings to no doctrines of which he fears the worldly influence may be shaken; he looks to no advantage from the continued degradation and ignorance of mankind; but, himself a worshipper of Truth, he wishes to behold the whole human race seeking and paying their devotions at the same pure and radiant shrine.

Together with the efforts to promote the physical improvement of the poorer classes of which I have spoken, I would here mention the attempts at this time making in many parts of this country, to excite them to a better feeling than that of depending, in all attacks of sickness, on the charity of those above them. These attempts are connected with the establishment of a more judicious system of affording medical aid to them. The great provident principle of the dispensaries, recommended by Mr. Smith, of Southam, is designed to encourage the poor to be prepared for evils which may be foreseen, or which may be reasonably expected, and thus to preserve, to a certain extent, their independence. This intention has, I must say, been much overlooked by

medical men, and the plan much misconceived. Unfortunately, also, in some towns, institutions have been conducted professedly on Mr. Smith's plan, but so curiously perverted from it, as entirely to exclude that self-dependent principle which is the very soul of the new system. In the pages of the Medical Gazette, and of the Edinburgh Medical and Surgical Journal, this subject has at length obtained that attention which was given to it nine years ago, with little effect, in the Medical Repository. Dr. Calvert, of London, has very forcibly advocated the cause of the Self-supporting Dispensaries; and the letter addressed by Dr. Kay to the President of the Ardwick and Ancoats Dispensary, of Manchester, contains the most convincing representations of the improvidence and degradation, and abuse of all true charity, inseparable from the older system which medical practitioners have so much apparent reluctance to modify.

All these improved institutions, all this enquiry, all these exertions, are, then, the characters of our time, and bespeak the advent of an age of which it will be the proud distinction that it found great masses of mankind deeply ignorant of much that concerned their health and their happiness, and left them better protected against illness and misery; that it found them debased, and left them advancing; that it found them sunk in insensibility to their moral and intellectual powers, and left them awakened to a sense of the exertions and duties to which God and nature had called them.

Among the medical events of the past year, it would be wrong to pass over an indication of inde-

pendent feeling, redeeming amidst too many examples of voluntary professional degradation. It had arisen from the eagerness of medical men to obtain appointments to public institutions, that on the announcement of any vacancy, the promoters of charities for the benefit of the sick poor were exposed to all the excitement and all the manœuvering attendant on a popular election. There were not, it is true, the treatings, the drinking, and the ribboned processions, but only the duller and deeper spots of such humiliating scenes; the abject solicitation, the secret circumvention, and the manufacture of votes. By the last mentioned device, claims established by honourable services were put aside, the real interests of charities trampled upon, the steady supporters of a charity outvoted, and the nominal supporters of one year indulged in a most pernicious patronage. It is gratifying to have to record, although I shall do it without comment, an example of manly opposition to this system, by the medical officers of the Aldersgate-street Dispensary,* which called forth prompt expressions of professional approbation, and went far to extinguish the corruption of medical elections for ever.

A great portion of the past year has been devoted, by many members of our profession, to the furtherance of a reform in medical institutions, involving so many interests, affecting so many prejudices, and, indeed, comprehending so many and such delicate particulars, that it would be most improper in me to pronounce more than a general opinion concern-

* Drs. Clutterbuck, Birkbeck, Lambe, Roberts, Mr. Salmon, and Mr. Coulson.

ing it on this occasion. When such great alterations are in progress, numerous impracticable plans are commonly proposed: but we may confidently trust the result to the good sense of the public, and to the general judgment and proper feeling of our profession, particularly when expressed with the moderation and dignity by which the suggestions of a very respected member of this Association, (Dr. Barlow,) in the pages of the Gazette, have been so especially distinguished.

But I must draw my observations towards a close: and in doing so, my thoughts again revert to the memory of him who was to have spoken this day. To the loss sustained by his death, a loss felt by the profession, and still more by the town in which we hold this meeting, it is unnecessary for me to bear further testimony. I have already endeavoured, in our Transactions, to do some justice to his character, and the reception which that attempt has met with, on the part of his friends, and of the medical public, has been deeply gratifying to me.

The French journals have, within the last few months, recorded the death of M. Boyer, a surgeon of great eminence in Paris, and who had attained to an advanced age. By his own desire, the usual laudatory discourses pronounced over the grave of departed men of science in that country, were omitted. But it has been said of him, that he raised himself to high rank and influence in his profession, without intrigue; and that his erudition was extensive. His appearance bespoke him one of the last representatives of the old school of French surgeons, as that of the late M. Portal very expressively

marked him as belonging to the ancient caste of court physicians. M. Boyer possessed, even in his latter years, a vivacity of manners which frequently exhibited him in remarkable contrast to his graver colleagues in the faculty of medicine. He was accused of being unwilling to open his mind to recent discoveries in surgical science, a fault somewhat incidental to age, and not to be too severely animadverted upon in those who, in their more active years, enlarged the science to which they were devoted.

The late Sir William Franklin, of the Army Medical Board, whose death took place in October last, has been mentioned by our different periodical publications in terms of high respect; and an account of his life is said to be preparing by the Rev. Mr. Bennett.

When looking over the leaves of one of the periodical works some months ago, I saw an announcement of the death of Dr. John Gordon Smith, and the distressing fact was stated that he died in prison. No tribute to his memory seems to have been paid by the publications of a profession of which he was once a useful, and even a distinguished member. No friendly hand has recorded the merits of one of the most unfortunate of men. A sense of justice, as well as a feeling of generous compassion, demands something more. When this ill-fated physician published the first edition of his Treatise on Forensic Medicine, his mind was vigorous and healthy, and that work was accepted and long quoted as one of high authority. In every successive edition, and in most of his subsequent publications, may, I think, be traced, among much that is acute and striking,

the marks of a mind somewhat declining towards disease. And such was really the case. He had become subject to attacks of violent and obstinate irritability of the stomach, and to these attacks invariably succeeded periods of great mental excitement, the subsidence of which was soon followed by a return of the gastric irritability. By these alternations, which afforded him little repose, his mental and bodily health became, in time, visibly impaired. His selt-control was much diminished, and he fell into eccentricities in writing, in conversation, in manners, and in dress. He made repeated attempts to deliver lectures on Medical Jurisprudence, but the commencement of a Course always seemed to aggravate or induce his mental excitement, and I doubt whether he ever completed one. He began to perceive that he was neglected, and he sometimes imagined that he was insulted, when no insult was intended. He became suspicious of his friends, and bitter, as far as words went, against his enemies. The limited state of his circumstances made his professorship in the London University an important consideration to him, yet he resigned it in haste, on a supposed affront; and the immediate filling up of the appointment too clearly shewed him that his retirement was not regretted. I have letters from him, written at that period, in which he calmly and affectingly states his melancholy situation; laments his irritability and its then irretrievable consequences; and expresses his painful disappointment at being, as it were, excluded from the arena of medical teaching, just when the great desire of his life was accomplished, by the admission of his favourite science as

an acknowledged part of medical study. He had laboured many years without reward; and when the reward seemed within his reach, he was consigned, he felt, to hopeless indolence. I saw Dr. Gordon Smith at that time frequently, and I beheld with concern a man of a mind of great acuteness, of considerable literary acquirements, of much wit, and great powers of conversation, and of a disposition singularly warm and confiding, but passing into obscurity, and with the prospect of ruin before him. Embarrassed circumstances, sickness, insanity—the mad-house and the prison—filled up, I greatly fear, the interval which followed between that time and the merciful close of his mortal existence. Yet to him the science of Medical Jurisprudence will always remain indebted; and it ought never to be forgotten that he was one of the first to shew, and zealously to advocate, what all now acknowledge, its usefulness and dignity. It is said that on more than one occasion he was instrumental in saving the life of an accused person, really innocent: if such were the case, that record on his tomb may well outweigh a life of pain and disappointment; and doubtless it will there be remembered where good men's deeds are not forgotten, and sorrow can exist no more.

Towards the end of the month of June, one of the oldest and most distinguished members of our profession, Sir Gilbert Blane, departed this life. He had attained the age of 84, and to the latest period seems to have preserved much of the ardour which was characteristic of him as a student. He is remembered, as is also the late Dr. Caleb Hillier Parry, among the most active presidents of the

Medical Society of Edinburgh, and not many years ago, their addresses, on being elevated to the chair, were printed by Dr. Duncan. Of both, the performances of the life were equal to the promises of youth, and both, after many useful services, rest in their graves with honour. The early years of Sir Gilbert Blane were spent in the medical department of the naval service, and he lived among those who were renowned in the most brilliant period of our naval glory. His works on the Diseases of Seamen, and of different Climates, prove that he was conscientious and indefatigable in the performance of his public duties.

Thus retracing the mortality which has marked the year, none who knew him will wonder that I should pause a moment on the name of Dr. Henry Gaulter. Amidst the crowd of aspiring students who did honour to Edinburgh about fifteen years ago, he was pre-eminently distinguished by the attainments of his mind, by talents which might justly be termed brilliant, by the elegance of his manners, by his cultivated taste, by a pure and graceful eloquence which charmed all hearers, and by a life regulated according to the precepts of the Divine Master of whom he was a devout and serious follower. Even previous to that period, although quite a young man, he had gained reputation in London as a lecturer on physiology. Domestic afflictions, and the death of an accomplished wife, acting on a sensitive mind, contributed to impair his health, and his studies at Edinburgh were interrupted by a journey to Italy, and a residence at Naples, where, as well as at Rome, he attracted much attention, and gained the

esteem and affection of all who became well acquainted with him. Always a cultivator of elegant learning, he occupied some part of his leisure on a work which he intended to publish, on some of the Antiquities of the neighbourhood of Rome, which had not been previously much noticed. On his return, he took a degree in Edinburgh, and for some time afterward he was a student of Magdalene Hall, Oxford. His health, which a mild climate appeared to have restored, became, however, again and repeatedly interrupted. A few years ago he settled at Manchester, from whence every account of him was but a report of successive indispositions. Yet, in a work entitled The Origin and Progress of the Malignant Cholera in Manchester, published in 1833, he gave a surprising proof of the exertion of which he was capable, as well as an admirable example of the method of collecting and recording information connected with epidemics. Despairing of the recovery of his health in England, he was latterly meditating a residence in the south of France or in Italy, from whence he entertained, I think, but a faint expectation of ever returning; although he still cherished some hope of eventually practising in London. Not long after I heard from him to this effect, I was informed that he was dead.

Whilst writing these lines, I have learned, with sincere regret, of the death of Dr. Becker, Lecturer on Medicine in the University of Berlin, and one of the Honorary Corresponding Members of this Association. Although no more than thirty-four years of age, he had gained the highest reputation, and was one of the most celebrated physicians of the

continent. His death was occasioned by fever, to which so many of the brightest ornaments of our profession have fallen victims, prepared, I fear, too often, by exertions persevered in with little regard to self-preservation, and by anxieties inseparable from medical duties.

From these subjects I turn once more to a consideration of those labours which, whether our lives be short or long, we know that we may usefully and honourably pursue. The progress of the Association has been detailed in the Report of the Council. Its increasing numbers, the objects which it keeps steadily in view, the information it has already placed before the public in two volumes of Transactions, and the enquiries which it proposes to institute and encourage, all are known to you. In future years, when many who now honour these meetings by their presence, and impart to the Association the character of their own intelligence and high respectability, shall be no more seen among us; when I who now deliver these perishable words to you, and many who hear them; when even that estimable physician to whom we owe these happy and useful meetings,* and to whom our Transactions will be a durable and fair monument—shall be no more actors in these scenes—let us hope that this Association, still carefully secured from little enmities and dissensions, and still devoted to great and useful objects, will remain a rallying point for all provincial practitioners who feel interested in maintaining the honour of the profession. We have no reason to apprehend that our successors will look back on the first pro-

* Dr. Hastings.

ceedings of the Association with any feelings but those of respect: they will see that our regards, not narrowed to our own little day, were extended forward to their days, and to the hidden days beyond them. Animated by the same pure ambition as the founders, I trust they will carry on medical knowledge beyond the point at which they themselves become engaged in its pursuit, and, in their turn, will cheerfully transmit it, by them increased, to other generations, by whom, with the permission of Providence, it may be more and more cultivated, to the end of time.

II. Reports read at the Birmingham Anniversary.

A REPORT

ON THE

CHEMISTRY OF THE BLOOD,

AS

ILLUSTRATIVE OF PATHOLOGY.

BY EGERTON A. JENNINGS, F. L. S.

Surgeon to the Leamington Charitable Bathing Institution.

In presenting this Report to the Provincial Medical and Surgical Association, I cannot but regret, in common with every member of it, that Dr. Henry, of Manchester, whose extensive chemical knowledge, and well-known general abilities, would have rendered his assistance so valuable, declined undertaking the task By his thus declining, I confess that I found myself in a position quite unexpected to me; I found myself placed as principal where I had only expected to be assistant, and that in an undertaking which, I could not but feel, required both greater talent, and more extensive information than I possessed. Thinking, however, that it would be more respectful to this Society, to present even an imperfect Report, than entirely to neglect com-

pliance with their request, I have used my best endeavours to comply with it; and though no one can be more sensible of the imperfections of the effort than myself, yet, I trust, under the circumstances, I shall not be accused of presumption in having attempted it. I have, in this report, confined myself entirely to one fluid, the blood, instead of attempting the whole of the fluids of the body. Indeed, unaided by Dr. Henry, and prevented by sickness, for four months, from pursuing any professional or literary engagement, I found even the examination of one fluid required more time than I could command.

A perfect knowledge of the constituents of healthy blood, must be acknowledged, on all hands, to be a necessary prelude to the study of its diseased characters. I should not, however, have deemed it necessary to enter upon this subject, in a report intended for persons so conversant with every department of medical knowledge as are the members of this Association, had not the blood been recently and very carefully analysed by many able chemists, and several discoveries made. But, such being the case, I have thought that an epitome of our present knowledge of the constituents of the blood, during health, might not prove unacceptable.

The blood, when first drawn from the human body, is, to all appearance, a homogeneous fluid. Its ordinary temperature is 96 degrees, Fahrenheit, and its specific gravity from 1.030 to 1.050.

After standing for some time it separates into two parts, a firm, red mass, called the crassamentum or clot, floating in a straw-coloured fluid called the

serum. The proportion the serum bears to the crassamentum is, in health, as 10 parts of serum to 13 or 14 parts of crassamentum.

When *serum* is exposed to heat in a water bath, it is coagulated, and if the evaporation be continued until it ceases to exhale moisture, a dry, brittle, semitransparent mass, of an amber colour, is left, which consists of albumen, salts, animal extractive, and fatty matter. The fluid evaporated is pure water.

When the residuum thus obtained by evaporation is powdered, and boiled in distilled water, a portion of it is dissolved. The portion thus soluble in distilled water, consists of alkaline salts and an animal compound, which compound is the muco-extractive matter of Marcet, and the albuminate of soda, and animal matter soluble in alcohol and water of Berzelius and Lecanu.

The residuum, after its exhaustion by the distilled water, yields, when boiled with alcohol, a quantity of oily matter. This oily matter, according to Lecanu, consists of two parts, the one oily and the other crystalline; but, according to Boudet, it is a compound of four different substances.

When, by boiling in water and alcohol, all the substances soluble in these fluids have been extracted, if the residuum be calcined in a platinum crucible, an earthy residuum remains, consisting of salts of lime and magnesia, with a trace of iron. The animal matter consumed during the calcination is albumen.

It therefore appears that serum is composed of water, albumen, animal extractive matter, fatty matter, alkaline salts, earthy salts, and a trace of iron.

The following table will show the proportions in which these constituents of healthy serum are combined, according to the analyses of Berzelius, Marcet, and Lecanu:

Table showing the constituents of Healthy Serum.

	LECANU.	BERZELIUS.	MARCET.
Water, ...	906.00	905.9	900.0
Albumen, ...	78.00	80.0	86.8
* Animal matter soluble in alcohol and water, ...	1.69		
* Albumen combined with soda, ...	2.10		
* Crystalline fatty matter, ...	1.20		
* Oily fatty matter, ...	1.00		
* Muco-extractive matter, ...	.....	.....	4.0
* Animal matter with lactate of soda,	.....	4.0	
Muriate of soda, ...	6.00	6.0	6.6
Muriate of potash, ...			
Carbonate of soda, ...			
Phosphate of soda, ...	2.10	4.1	2.0
Sulphate of soda, ...			
Carbonate of lime, ...			
Carbonate of magnesia, ...			
Phosphate of lime, ...	0.91	.....	0.6
Phosphate of magnesia, ...			
Phosphate of iron, ...			
Loss, ...	1.00	.....	.....
Total, ...	1000.00	1000.0	1000.0

The *crassamentum* or clot consists of two substances, fibrine and colouring matter. These may be separated by agitating the clot with distilled water, by which process the colouring matter is dissolved, and the fibrine separated in the form of white flakes. In addition to the colouring matter and fibrine, the crassamentum at all times contains a quantity of serum, the proportion of which diminishes as the density of the clot increases.

The following table will show the constituents of healthy blood, according to Lecanu:—

* The same constituents, but differently named and more minutely investigated by Lecanu.

Table showing the constituents of Healthy Blood.

	1st Analysis.	2nd Analysis.
Water, ...	780.145	785.590
Fibrine, ...	2.100	3.565
Albumen, ...	65.090	69.415
Fatty matter,		
a. Crystalline,...	2.430	4.300
b. Oily, ...	1.310	2.270
Colouring matter, ...	133.000	119.626
Extractive matter, *soluble in alcohol and water*,...	1.790	1.920
Albumen combined with soda,...	1.265	2.010
Muriate of soda, ...		
Muriate of potash, ...		
Carbonate, ...	8.370	7.304
Phosphate, Alkaline, ...		
Sulphate, ...		
Carbonate of lime, ...		
Carbonate of magnesia, ...		
Phosphate of lime, ...	2.100	1.414
Phosphate of magnesia, ...		
Phosphate of iron, ...		
Loss, ...	2.400	2.586
Total, ...	1000.000	1000.000

The proportion of WATER in healthy blood is, according to Lecanu, greater in females than in males. In males he found the medium quantity in 1000 parts, to be 791.941, and in females, 821.764. The temperament of the individual is found to vary with the proportion of water in the blood; in the male of sanguine temperament it contained 786.584; in the lymphatic, the water was increased to 830.566; in the sanguineous female, 793.007; in the lymphatic, 803.716.

The quantity of ALBUMEN in 1000 parts of healthy blood, appears to have no relation to the sex or temperament of the individual, nor to the age of the person from 20 to 60 years. Its maximum is stated by Lecanu to be 78.270, its minimum 57,890.

The proportion of FIBRINE in healthy blood varies considerably. Berzelius states its proportion as only 0.75 in 1000 parts: Lessaigne found it, in a vigorous young man, 1.7: Scudamore never met with it in larger proportions than 4.43. Lecanu has investigated this subject with great care, and has found the quantity of dry fibrine, in 1000 parts, to vary from 1.360 to 7.236. He considers 4.298 as the medium. In young and middle-aged persons of sanguine temperament, the proportion of fibrine was the greatest.

The GLOBULES, or colouring matter, contained in healthy blood, varies much in its proportion. Lecanu states the maximum to be 148.450, the minimum 68.349, and the medium 108.399 in 1000 parts. The blood of males contains a larger proportion of globules than that of females, the medium in males being 132.150, and in females 99.169. In the sanguine temperament, where it will be remembered that the water is less, the globules are more abundant than in the lymphatic; the medium quantity in males of the lymphatic temperament being 116.667, and in the sanguineous 136 497, being an increase of 19 830 in 1000 parts. The age, between 20 and 60, appears to have no effect on the proportion of globules. Repeated bleeding diminishes the proportion considerably.

The globules of the blood are, as their name signifies, of a globular figure. Their colour depends upon a coating of colouring matter which surrounds them, and which may be removed without destroying their spherical form. The most recent inquirers are all agreed in considering the colouring matter as

exclusively animal, but the composition of the substance is entirely unknown. When a portion of crassamentum is calcined in a platinum crucible, a quantity of ashes remain strongly impregnated with iron; but Berzelius states that the nicest tests do not discover any iron in the globules before their destruction by combustion: therefore, unless we suppose iron to be absolutely formed during the combustion, we must assume its existence in the globules of the blood in a state different to any with which chemists are acquainted.

The red covering of the globules does not appear to be of such importance as some of the other constituents of the blood. In man, numerous parts do not possess vessels conveying red blood. In certain insects the blood is colourless; and in amphibious animals and fishes a few parts only, such as the heart, liver, and gills, are supplied with red blood, whilst the rest of the animal is supplied with colourless blood. The red matter does not appear to be formed so soon as the other parts of the blood, for in the chick the heart may be seen beating when it only contains colourless blood.

The experiments of M. M. Prevost and Dumas* would render it probable that the higher the natural temperature of the animal, the larger the proportion of red globules, and that arterial contains a larger proportion than venous blood.

The general proportion of FATTY MATTER in the blood is about 4 in 1000 parts. Its proportion, however, varies considerably. It would appear to be increased in quantity soon after the completion of

* Ann. Chim. et Phys. t. xxiii. p. 50.

digestion. Milky serum owes its colour to its excess. Recent analyses have proved the fatty matter to be composed of four constituents: 1st, seroline, a peculiar animal principle recently discovered by M. Felix Boudet;* 2nd, cholesterine; 3rd, a soap, soluble in water; 4th, the fatty matter of the brain, or, as it has been termed by Vauquelin, cerebrine, which is the substance described by Dennis under the name of phosphuretted fat.

The ANIMAL MATTER, SOLUBLE IN ALCOHOL AND WATER, is considered by Berzelius to be a compound of albumen and soda. It does not, however, appear to have been so minutely examined, or to be so well understood as most of the other components of the blood.

The proportion of ALKALINE SALTS in healthy blood is about 8 in 1000 parts. The attention of chemists has of late been particularly directed to them, in consequence of the observations of Dr. Stevens† proving that the change of colour which takes place in the blood during respiration, is closely connected with the presence of saline matter, and, also, that its proportion varies considerably in disease.

The EARTHY SALTS exist in the blood in very small proportions. They are so closely combined with the albumen, that chemical re-agents do not detect their presence until the albumen has been destroyed by combustion.

The composition of the blood at different ages appears to vary. According to Dr. Bostock,‡ the

* Journal de Pharmacie Juin 1833.

† Stevens on the Blood.

‡ Bostock's Physiology, vol. i. p. 481.

proportion of azote increases as life advances. Fourcroy* states that fætal blood contains no fibrine, but, in its stead, a gelatinous substance, and, also, that it contains no phosphoric salts. My own experiments do not confirm the observations of Fourcroy. In several analyses of fætal blood, I have not failed to detect both fibrine and earthy phosphates. The most important changes which take place in the blood in old age, appear to result from two causes; 1st, a general diminution in the proportion of the fluids to the solids of the body; 2nd, a diminished proportion of arterial to venous blood. The latter change depends on the arteries diminishing in caliber, while the veins become tortuous and more dilated, the veins thus distended retain an increased proportion of venous blood, and reduce still further the supply of arterial blood, already diminished by the general reduction of the circulating fluid.

The proportion between the entire weight of the body and that of the blood it contains, will vary from many causes. Young animals have more blood than adult ones, more being needed to increase their size. Adults have more than the aged, as in the vigour of life nutrition and secretion are more vigorously performed. In old age the vascularity of the body diminishes, and the whole frame decays. Fat animals possess less blood than lean ones; tame animals, which are confined, less blood than wild ones. The proportion of blood to the entire body, in a healthy man, appears to be 175 parts in every 1000.†

* Ann. Chim. t. 7, p. 162.

† Wilson on the blood.

The changes produced, by respiration, in the blood, are too well known to the members of this Association to need recapitulation. Some recent observations and discoveries respecting the diffusion of gases, and some experiments on the effects of certain salts on the colour of the blood, may not, however, be misplaced, as they appear to throw some new light on this interesting subject.

Döberenier first noticed that if a receiver, having a crack in it, be filled with hydrogen, and placed over water, the gas slowly escapes by the fissure, while the water rises sometimes to the height of three inches. This phenomenon was explained by Gustavus Magnus,* who supposed the crack to absorb the gas, as a porous body does, the hydrogen again evaporating from the external surface, where it comes in contact with the atmosphere. This explanation he strengthened by showing, that if an open tube closed at one end with a piece of bladder, be then filled with water, inverted over mercury and left at rest, the water escapes from the tube, while the mercury rises to supply its place. Another interesting fact was added to our knowledge by Mr. Graham † He introduced a bladder partially filled with coal gas, into a receiver filled with carbonic acid gas; in a short time it became distended almost to bursting. A large quantity of carbonic acid gas had entered the bladder, while a small quantity of coal gas had entered the receiver.

The experiment of Mr. Graham was repeated, with modifications, by Baumgartner, of Vienna, and

* Poggendorf's Annalen, X. p. 153.

† Journal of the Royal Institution, Sept. 1829, p. 74.

investigated more at large by Mr. Mitchell.* This latter gentleman filled a vessel with atmospheric air, and having closed it with a thin covering of caoutchouc, placed it in an atmosphere of hydrogen gas; the hydrogen passed into the vessel until the membrane burst *outwards*. He then filled a vessel with hydrogen, closed it as before, and placed it in a vessel containing atmospheric air; the hydrogen escaped from the inner vessel until the membrane burst *inwards*.

Mr. Graham, at a subsequent period,† came to the following conclusions on this subject.

1st. That the tendency of two different gases, separated by a porous diaphragm, is to mutual equable diffusion.

2nd. That this diffusion is not necessarily in equal volumes, being inversely proportional to the square root of the density of each gas.

Thus, if a bladder of common air be placed in a receiver of hydrogen gas, the two gases are disposed to diffuse themselves equably through each other, till the ratio between their volumes is equal. But, from the difference of their density, for every volume of common air which passes out of the bladder, 3.97 volumes of hydrogen pass in, which occasions the remarkable distension of the bladder. If a bladder of hydrogen be left in the open air, the tendency is the same, but from their different density, for one volume of air passing into the bladder, 3.97 of hydrogen will pass out.

* Journal of the Royal Institution. N. S. V. 2, pp. 101, 307.

† Edinburgh Transactions, v. xii. p. 222; and London and Edinb. Phil. Mag. v. ii. p. 175.

Similar phenomena present themselves if instead of hydrogen and atmospheric air, atmospheric air and carbonic acid be employed.

Dr. Stevens* has proved by experiments, which have been confirmed by Dr. Turner,† that if perfectly florid arterial blood be allowed to coagulate, and the clot be repeatedly washed with distilled water, its colour gradually becomes black. The arterial tinge does not return on exposure to atmospheric air, but the addition of a solution of common salt, carbonate of soda, and other neutral salts, restores the original colour.

It has long been known that the addition of an acid to the blood darkens its colour. Reasoning upon these grounds, Dr. Stevens concludes,

1st. That the colour of the arterial blood depends on the saline matter.

2nd. That all acids blacken the blood, and that the blackness of venous blood depends upon the presence of carbonic acid.

3rd. That in the lungs the carbonic acid is removed and replaced by a portion of oxygen, on a principle similar to that already laid down, when, the carbonic acid being removed, the saline matter restores the arterial colour of the blood.

Since the propagation of these opinions by Dr. Stevens, the subject has been further examined by Dr. Wm. Gregory and Mr. Irvine.‡ They introduced portions of clot, freed, by washing, from

* Stevens on the Blood, p. 16.

† Turner's Chemistry, p. 903.

‡ Monthly Archives of Medical Sciences, and Medical Gazette, Feb. 1834.

serum, into vessels containing pure hydrogen, nitrogen, and carbonic acid, placed over mercury. As soon as the strong saline solution came in contact with them, the colour of the clot, in all three gases, changed from black to bright red, and the same change was found to take place in the Torricellian vacuum. On repeating these experiments with the serum of the blood, and a solution of salt in water of equal strength to serum, no change took place until atmospheric air, or oxygen gas, was admitted. It therefore appears that though saline matter be necessary to effect the change of colour, from that of venous to that of arterial blood, still, with so dilute a saline solution as that which exists in serum, the presence of oxygen is also necessary.

M. M. Macaire and Marcet,* appear to prove that other changes take place in the blood, in its conversion from the venous to the arterial state, besides those effected by the action of oxygen and saline matter. They state that, after the colour of venous blood has been rendered florid by agitation in contact with air, it furnishes, on drying, a deep brown red powder, similar to that obtained from venous blood under ordinary circumstances, while arterial blood furnishes a fine clear red powder. They further state that, on analysis, it yields more carbon than arterial blood does. It therefore appears that some change takes place in the constitution of blood, during its circulation through the lungs, besides the alteration of its colour, which depends on the combined action of oxygen and saline matter.

* Bib. Univ. Avril, 1832; and Sulliman's American Journal of Science and Art, v. xxiii. p. 384.

The blood, in many diseases, presents material alterations in its chemical constituents. The investigation of these changes presents at once an important and difficult inquiry. At present, our knowledge of the subject may be considered in its infancy, but still we know enough to perceive the great advantages we may gain by knowing more.

In treating of the chemical pathology of the blood, two modes of proceeding present themselves, either to examine, individually, the constituents of the blood, noticing with each constituent what diseases are present when its proportion is diminished, and what others when it is in excess; or, on the other hand, to examine numerous specimens of blood in individual diseases, distinguishing such alterations as are constant, from such as are only occasional.

There can be no doubt but the former mode, if practicable, would present at once the most scientific and the most interesting mode of proceeding. It appears, however, to me, that, at present, our knowledge of the changes in the blood in individual affections, is far too scanty to admit of any generalization, without running into the vague field of conjecture, a proceeding sufficiently attractive to a writer, but most injurious to the progress of science. I have, therefore, been contented to collect the analyses which have been published, of blood taken during different diseases, adding such analyses and observations of my own, as I have thought calculated to throw light upon the subject. I am fully aware how many diseases there are, in which we are entirely ignorant of the attendant changes in the blood, and sincerely hope that many members of

our Association will assiduously devote themselves to the examination of such cases, for, until we have accumulated many more facts than we at present possess, any attempt at generalization would prove at once futile and injurious.

The chemical changes which take place in the blood during *fever*, are but imperfectly known. In those we are acquainted with, it is difficult to say which should be considered as results, and which as causes of the disease. Its physical changes render it evident, that material alterations do take place in the blood during fever, but with the nature of many of these changes we are unacquainted. It may, perhaps, be expedient to give a brief outline of these changes in its appearance, before entering on its strictly chemical alterations.

During the *first* stage of fever, or that of depression, the blood, for the most part, flows with difficulty; its colour is dark, it coagulates rapidly, and forms a loose dark-coloured clot, large, in bulk, when compared with the serum in which it floats. During the *second* stage, or that of excitement, the blood flows freely, is scarlet in colour, coagulates with less rapidity than in the first stage, and forms a firmer clot, which, occasionally, presents a light buff coat. During the *third* stage, or that of collapse, the blood flows with great freedom, frequently exuding through the tissues of the body. It is extremely thin, watery and dark coloured; coagulation is imperfectly performed; the clot being loose and flocculent, sometimes presenting more the appearance of a subsidence of the colouring matter than of a coagulum.

Throughout the whole of *typhus*, the blood is generally exceedingly watery; in the second stage, even, it will frequently coagulate very imperfectly; and in the last stage it seems nearly altogether deprived of fibrine.*

It would appear, from the observations of M. Andral,† that, during inflammatory fever, the entire quantity of the circulating fluid is increased. At no period of the disease, does the proportion of fibrine appear to be materially increased, but during the latter stages of simple fever, and throughout the whole course of typhoid fever, there is a great deficiency of fibrine.

The researches of Dr. Stevens‡ respecting the state of blood in yellow fever, have proved that, in this affection, it is almost deprived of its saline contents, which would be quite sufficient to account for its dark colour. He also found that this change took place in the blood before the several symptoms of fever presented themselves,—indeed, it appeared to be gradually taking place before the attack. If such be the case, we cannot look upon the loss of saline matter as a result of the febrile action. Whether or not it be the first change induced by the morbific poison, and a cause of the subsequent diseased actions which we call fever, future observations must determine.

In a few cases where I have analysed blood taken from patients labouring under common continued fever, the proportion of alkaline salts in the serum

* Copland's Dictionary of Practical Medicine. Art. Blood.

† Andral's Pathology.

‡ Stevens on the Blood, pp. 209 and 214.

has been materially diminished, though not to the extent in which they were found deficient by Dr. Stevens, in cases of yellow fever. From the following table showing the results of three analyses of serum, taken during fever, it appears that the proportion of alkaline salts is diminished one half, and that this diminution is found to have taken place at the very commencement of the disease. It will also be observed that in no other respect does the serum present any material alteration from the healthy standard.

Comparative Analysis of Serum in Health and Continued Fever.

INGREDIENTS.	Healthy Standard of Lecanu.	Male, æt. 31. 1st day of Fever.	Male, æt. 34. 1st day of Fever.	Female æt. 14. 4th day of Fever.	Average of the three Fev. cases.
Water,...	906.00	904.	903.	944.	917.
Albumen, ...	78.00	80.	82.	41.	67.6
Animal extractive matter, ...	3.79	5.	5.	4.	4.6
Fatty matter, ...	2.20	3.	4.	4.	3.6
Alkaline salts, ... Muriate of soda, ... Muriate of potash, ... Carbonate of soda, ... Phosphate of soda, ... Sulphate of soda, ...	8.10	4.	5.	4.2	4.4
Earthy salts, ... Carbonate of lime, ... Carbonate of magnesia,... Phosphate of lime, ... Phosphate of magnesia,... Iron, ...	0.91	2.	1.	1.	1.3
Loss, ...	1.00	2.		1.8	
Total, ...	1000.00	1000.	1000.	1000.0	
Specific gravity of serum, ...	1.028	1.032	1.032	1.021	1.028

My own observations would confirm the opinion expressed by M. Andral, that the proportion of fibrine is not increased during continued fever. I have only one analysis to offer in illustration of this point, but as this specimen of blood was taken from a well marked case of fever, which had advanced

to the fourth day, it appears worth recording. The following table contains the results of this analysis, together with the healthy standard for comparison.*

Comparative Analysis of Blood in Health and continued Fever.

INGREDIENTS.	Healthy standard of Lecanu.	Female æt. 14. 4th day of Fever.
Water, ...	780.145	856.
Fibrine, ...	2.100	2.
Albumen, ...	65.090	37.
Fatty matter, ...	3.740	3.
Colouring matter, ...	133.000	91.
Extractive matter, *soluble in alcohol, and water*, ... Albumen combined with soda,...	3.055	3.
Alkaline salts, ... Muriate of soda, ... Muriate of potash, ... Carbonate, ... Phosphate, Alkaline, ... Sulphate, ...	8.370	3.8
Earthy Salts, ... Carbonate of lime, ... Carbonate of magnesia,... ... Phosphate of lime, ... Phosphate of magnesia,... ... Iron, ...	2.100	1.
Loss, ...	2.400	3.2
Total, ...	1000.000	1000.0
	Serum. Clot.	Serum. Clot.
Proportion between serum and crassamentum,...	10 + 13	10 + 9.5

* I have confined myself to publishing the *results* of my analyses of blood, from the great length to which this Report would have extended, had I entered into the *details*. The processes I have employed in my analyses have been very similar to those recommended by Dr. O'Shaughnessy, in his "Report on the Chemical Pathology of Cholera," except in the examination of the fatty matter, where I have generally pursued the course of analysis employed by M. Boudet.

I cannot but acknowledge the great assistance I have received in preparing this Report, from the liberality with which my professional brethren, generally, have supplied me with specimens of blood, from well marked cases of disease. I am more particularly indebted for such assistance to my highly-valued friend, Mr. Savory, of Wendover, to Mr. Mash, of the Northampton Hospital, and to Mr. Boulton, of this place. To the last of these gentlemen I am also indebted, for his personal assistance in a considerable number of the analyses.

In *Inflammation* the peculiar appearance presented by the blood has long been noticed by nosologists, and by its character have they been, in a great measure, guided in their decision respecting future bleedings. The appearance of the blood during inflammation, and the circumstances tending to produce, or prevent, the formation of a buffy coat, it is unnecessary here to enumerate.

Mr. Thackrah* has performed numerous experiments to ascertain the relative proportion between the serum and crassamentum in different diseases. In the following table are collected the results of these experiments in relation to inflammation.

Table showing the proportion of serum to crassamentum in Inflammation, according to Mr. Thackrah.

Disease.	No. of Experiment.	Proportion of Serum to Crassamentum.	
		Serum.	*Crassamentum.*
The proportion in health, ...	.....	10	13.
Pneumonia, ...	Ex. 58.	10	28.2
second bleeding, ...		10	13.7
Mild Gastritis, ...	Ex. 59.	10	28.1
Enteritis, ...	Ex. 60.	10	15.9
second bleeding, ...		10	18.6
Incipient Enteritis, ...	Ex. 62.	10	17.3
Acute disease of Heart, ...	Ex. 63.	10	19.2

Taking the average of these experiments, it would appear that, during inflammation, every 10 parts of serum is united to rather more than 20 parts of crassamentum, while in health it is united to 13 parts of crassamentum only. Hence, in inflammation the proportion of clot to serum would appear to be increased one half. I cannot, however, say that my

* Inquiries into the nature and properties of Blood.

own observations would induce me to consider the crassamentum nearly so much increased in proportion to the serum, as Mr. Thackrah found it. This difference in our results, probably, depends on my having allowed a greater length of time for the serum and crassamentum to separate, before estimating their respective weights, than that allowed by him.

Sir Charles Scudamore* has endeavoured to ascertain the proportion of fibrine in every 1000 parts of crassamentum. The result of numerous experiments performed by him, would indicate that, in health, every 1000 parts of crassamentum contains 3.6 of fibrine. The following table, compiled from his experiments, shows the proportion he found during inflammation.

Table showing the quantity of fibrine in 1000 *parts of crassamentum during Inflammation.*

Disease.	Character of Clot.	No. of Experiment.	Quantity of dried fibrine in 1000 parts.
Slight Pleurisy,	Slightly buffed, ...	Ex. 76.	7.05
Pain in side, ...	Slightly buffed, ...	Ex. 81.	11.37
Cough, ...	.....	Ex. 75.	7.24
Acute Gout, ...	Not buffed, firm texture, ...	Ex. 82.	5.88
Not named, ...	Compact, buffed and cupped,	Ex. 70.	12.41
Not named, ...	Compact, buffed and cupped,	Ex. 71.	13.73
Average of the above specimens of Inflammation,... ...			9.62
Average of Health, ...			3.6

From the above experiments, we should be led to conclude that, in inflammation, the crassamentum contains nearly three times the healthy proportion of fibrine.

* Essay on the Blood.

It has appeared, however, to me, that any averages formed either on the proportion between the clot and serum, or on the proportion of fibrine in a given quantity of clot, must be liable to fallacy, from the increase which takes place in the density of the clot, for many hours after the abstraction of blood. Nor can this source of error be avoided by always making the experiments at a given time after the abstraction of the blood, as many circumstances tend to accelerate or retard the formation and condensation of the clot. In my own experiments I have, therefore, examined the entire blood, which, though more troublesome, appears to be less open to error than any other method. In the annexed table, I have collected the results of some analyses of blood taken from patients labouring under inflammation of different organs.

Comparative Analysis of Blood in Health and in Inflammation.

INGREDIENTS.	Healthy Standard of Lecanu.	Pleuritis.	Pneumonia. Male, æt. 22	Inflammation after injury. Male, æt. 30.	Pneumonia.	Peritonitis superseding Rheumatism. Male.	Cystitis. Female, æt. 32.	Hysteritis, Female, æt. 32.	Hepatitis.	Average of Inflammation
Water, ...	780.145	792.	777.	737.	742.	802.	842.	825.	784.	787.625
Fibrine, ...	2.100	9.	8.	11.	6.	5.3	7.	6.9	7.	7.525
Albumen, ...	65.090	80.	71.	78.	74.	71.	64.	70.	78.	73.250
Fatty matter, ...	3.740	1.	2.	2.	2.	.8	3.	1.	3.	1.850
Colouring matter, ...	133.000	105.	128.	159.	162.	110.	72.	86.	117.	117.375
Extractive matter, soluble in alcohol and water, ... Albumen combined with soda,	3.055	3.	3.	3.	3.	3.	2.	2.	1.	2.125
Alkaline salts, ... Muriate of soda, ... Muriate of potash, ... Carbonate, Phosphate, Sulphate, Alkaline,...	8.370	4.9	4.8	5.1	4.3	4.2	4.4	4.	5.6	4.650
Earthy salts, ... Carbonate of lime, ... Carbonate of magnesia, Phosphate of lime, ... Phosphate of magnesia, Iron, ...	2.100	2.	3.	2.	2.	1.	1.	2.	2.	1.875
Loss, ...	2.400	3.1	3.2	2.9	4.7	2.7	4.6	3.1	2.4	
Total, ...	1000.000	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0	1000.0	
Specific gravity of Serum, ...	1.028	1.035	1.034	1.034			1.029	1.030		
Proportion of clot to serum, ...	Serum. Clot. 10 + 13	Ser. Clot. 10 + 11	Ser. Clot. 10 + 13.5	Serum. Clot. 10 + 16	Ser. Clot. 10 + 14	Serum. Clot. 10 + 14	Ser. Clot. 10 + 5.5	Ser. Clot. 10 + 6		

On inspecting the accompanying table, two things strike us; first, the increased proportion of fibrine, confirming the observations of Mr. Thackrah, Sir Charles Scudamore, and others; second, the greatly diminished proportion of alkaline salts, a change corresponding with that which takes place in fever. The other constituents of the blood do not appear to be materially altered from the healthy standard, or, if increased in one case, appear to be diminished in others. Taking the average of these experiments, we may conclude that, in inflammation, the proportion of fibrine to the entire blood is increased to more than three times the healthy average, while the alkaline salts are diminished one half. We are not prepared, at present, to say what may be the effect of the latter change, but, taken in connection with the diminished proportion of alkaline salts in fever, it is an interesting fact. With respect to the former change, pathologists agree in considering an increase of fibrine as greatly increasing the stimulating properties of the blood. In inflammation it would appear that the increased proportion of fibrine is not a result of the increased vascular action, but precedes it, for in several cases of inflammation where I have bled the patient before the shivering had subsided, and in others where the blood was taken within a few hours of its occurrence, the increased proportion of fibrine was found to exist.

M. Andral,* who, as already stated, considers general increase of the circulating fluid to be the cause of fever, points out some strongly marked differences between fever and inflammation, dependent

* Andral's Pathology, vol. 1, p. 665.

on the different character of the blood in the two affections. In fever, from the general hyperæmia, every organ becomes excited, so that death may result from such excitation; when superabundance of blood will be found all over the body, but in no part any serious lesion, or any alteration of texture. In such cases there exists that state of pyræxia, termed inflammatory fever. But if, instead of being simply in excess, the blood contain more fibrine than ordinary, its exciting power will be still greater, and what it did in the former case by its increased quantity, it will now do by its alteration in quality. Under such circumstances, is it not evident that the first indication to be fulfilled, must be to dilute the fibrine with more water? Hence the utility of diminishing the quantity of fibrine by bleeding, and of administering plentifully aqueous drinks. M. Piorry has lately announced, that one of the means of preventing the formation of false membranes in croup, is to gorge the patient with water, and M. Magendie has seen the symptoms of meningitis diminished by injecting water into the veins of the patient.

The great difference in the proportion of fibrine in the blood during inflammation, and that which exists during inflammatory fever, naturally points out an equal difference between primary organic inflammation, and that which occurs during fever. In the former, from the great increase of fibrine in the blood, the most energetic treatment is necessary to prevent vital injury of the part, by the deposition of new products. In the latter, where, for the most part, hyperæmia of the organ alone exists, local or small general bleeding, or even freely emptying the

vessels by copious intestinal evacuations, will frequently be sufficient to subdue the inflammatory symptoms. If such be the case in inflammatory fever, the diminished proportion of fibrine in the blood throughout typhus fever, explains still more satisfactorily the difficulty with which the constitution bears up against general bleeding in that affection, and even where inflammation appears to exist, gives us an assurance that there is little danger of new products being deposited. Indeed, when in typhus fever inflammation has existed, ulceration,—the destruction of old and not the formation of new parts, is the change we most frequently find after death.

Our present knowledge of the alterations of the blood during inflammation, is not sufficiently perfect to enable us to decide whether or not specific differences exist in each specific inflammation. If no primary specific change take place, we can scarcely suppose the function of an important viscus to be deranged, for any considerable period, without producing some corresponding change in the blood. In the preceding table* it will be observed that, in two affections, while the blood possessed the general characters of inflammation, a great increase in the proportion of water was superadded. In one *(cystitis,)* the secretion of urine was considerably diminished; in the other *(hysteritis,)* the secretion of milk and lochial discharge were both checked. These circumstances are not adverted to, as proving increased proportion of water in the blood, to be the result of this diminished secretion of aqueous fluids,

* Page 66.

though it naturally leads to such a conclusion, but with a wish to direct the observation of others to ascertain whether such effect be constant in these affections. It is only by the accumulated observations of many, that such points can be satisfactorily investigated, and for such accumulation of evidence, this society offers the greatest advantages.

When inflammation is combined with any other affection, attended with an altered condition of the blood, we have the changes of the blood from inflammation, combined with those occasioned by the disease with which it is united. Thus with hepatitis, jaundice is frequently combined, and here we have the changes in the blood produced by inflammation combined with those occasioned by jaundice. Before entering upon this combination, it is necessary to state what is known respecting the changes in the blood during *jaundice*. The experiments of M. Lecanu* have proved that, during *jaundice*, the blood contains both the colouring matter and resin of the bile. This very interesting subject has been also investigated by Mr. Kane,† who met with results similar to those of M. Lecanu. In a few cases of jaundice, where I have had an opportunity of investigating this point, my results have accorded with theirs. The biliary matter which is thus detected in the blood, appears to be absorbed; but its accumulation, to any great extent, is prevented by the rapidity with which it is expelled from the system in the urinary secretion. Probably it is for the express purpose of being thus expelled, that the biliary matter is conveyed into the blood.

* Journal de Pharmacie, Oct. 1831.

† Dublin Journal, vol. ii. p. 346.

In the following table I have brought together the results of four analyses of jaundiced blood. Two of these analyses were performed by M. Lecanu, one by Mr. Kane, and one by myself. The constituents of healthy blood are placed by the side, for the sake of comparison.

Comparative table showing the constituents of the Blood in Health and in Jaundice.

CONSTITUENTS.	Healthy Standard of Lecanu.	Blood taken during Jaundice.			
		M. LECANU.	M. LECANU.	MR. KANE.	MR. JENNINGS.
Water, ...	780.145	828.66	830.	762.28	810.88
Albumen, ...	65.090	76.82	65.	71.40	73.02
Fibrine, ...	2.100	1.87	2.	2.80	3.60
Colouring matter, ...	133.000	77.75	95.	126.70	100.40
Fatty matter and biliary matter,...	*3.740	†14.90	†8.	2.00	3.31
Salts, loss, &c.	15.925			34.82	8.79
Total, ...	1000.000	1000.00	1000.	1000.00	1000.00

It does not appear from these analyses, that the general constituents of the blood are, in this disease, materially altered from the healthy standard; unless it be that the proportion of colouring matter is somewhat diminished. There is, however, one other change in jaundiced blood, noticed by M. Lecanu, and confirmed by Mr. Kane, which must not be passed over. It is the absence of cholesterine. Whether this will be found constantly absent, remains to be proved. In specimens of jaundiced blood, where I have carefully sought for it, none could be detected, though it may readily be obtained

* This is the proportion of fatty matter in health, and, of course, is not combined with biliary matter.

† In both these analyses of M. Lecanu, the salts, fatty matter, biliary matter, and loss, are all added together.

from healthy blood. Cholesterine constitutes the chief proportion of the weight of biliary calculi: how its absence from the blood, and its accumulation in the biliary ducts may be related to each other, remains to be explained.

Though jaundiced blood possesses the chief constituents in healthy proportion, when no inflammation is going on, yet, as already stated, when combined with *hepatitis,* the blood puts on the inflammatory character in addition to that of jaundice, i. e. in addition to the presence of biliary matter and the absence of cholesterine, there is an excess of fibrine, and a diminished proportion of saline matter in the blood.

The analysis of the blood in *Rheumatism,* has not, at present, afforded us any satisfactory information respecting that disease. The intensely arterial colour of the blood in rheumatism, the pulsatory motion with which it is frequently expelled from the vein in bleeding, and the uncertainty of the effect of bleeding on the disease, all point out a marked difference between the character of blood in rheumatism, and in fever or inflammation; yet when we notice the extreme mobility of rheumatic pains, which appear to run wherever the blood is distributed; when we see the application of a few leeches to the part entirely remove the pain, which shortly re-appears in some other place, and when we see a single free bleeding sometimes stop the disease, as if by diminishing the fluid, it proportionably cut off the stimulus which occasioned all these migratory irritations, we cannot (as M. Andral has remarked,) but look to the blood as a material agent in the production of rheumatism.

The most marked change which the blood in rheumatism presents, is the altered character of its fibrine. Where rheumatism exists, bleeding may be repeated until the proportion of clot to serum shall not be one third so great as usual; until the proportion of fibrine to the entire blood shall be below that of health, and yet a buffy coat shall be present. In rheumatism the surface of the clot will frequently be covered with a buffy coat, while the parts beneath will be so loose as to break down when touched ever so lightly. In fact, it would appear that in rheumatism, the buffy coat does not depend, as in inflammation, upon the increased proportion of fibrine, but on some specific alteration in its nature, which chemistry is at present unable to appreciate.

In *Gout*, according to M. Andral,* the blood becomes loaded with earthy phosphates and highly azotised products, which occasion the train of symptoms we call gout. It has been noticed that gout is connected with three principal phenomena, concretions about the joints, calcareous deposit in the arteries, and gravel in the urinary passages. It is also known that gouty persons have, generally, been guilty of excess, and partaken too freely of animal food. M. Magendie has shown that, on feeding a carniverous animal with substances containing little azote, the uric acid and phosphate of lime will disappear from the urine. From this it appears that if an individual indulge largely in substances containing much azote, his urine must carry out of the system a greatly increased quantity of uric acid and phosphate of lime. In consequence of this the urine

* Andral's Pathology, vol. ii. p. 397.

becomes loaded with gravel, and if the quantity of these substances be so great that the urine cannot get rid of them, then other channels are opened for their discharge. Uric acid, of which gouty concretions are formed, is secreted by the vessels around the joints. The establishment of a process of secretion is always attended with increased vascular action in the part, and hence the pain which precedes and attends the deposition.

The deposition of calcareous matter in the arteries is another result of the same condition of the blood, and hence all of these phenomena are results of one and the same cause, excess of earthy and azotised products in the blood. To restore the blood to its healthy character, the natural indication would be, to cut off the supply of azotised substances to the body, by diminishing the quantity of food taken, and more particularly the proportion of animal and other stimulating food, which is exactly the treatment found most efficient.

Dropsy appears not unfrequently to result from an altered state of the blood. It is, however, one of those affections which should be looked upon rather as symptomatic of some previous disease, than as constituting itself a primary affection. It may, in fact, be the result of diseases totally differing from each other in character. When dropsy depends on the altered condition of the blood, that fluid, in different cases, presents very different characters. A watery state of the blood, attended with a great diminution of the quantity of fibrine it contains, is sometimes a cause of dropsy. When dropsy occurs epidemically, in seasons of great scarcity, and indi-

viduals are reduced to scanty and innutritious diet, this change in the blood takes place. M. Andral* relates some cases of persons who died dropsical, in whom the blood was reduced to a reddish watery fluid, and possessed no power of coagulation. An entirely different state of the blood, however, frequently exists in dropsy, for the disease, in some cases, appears to be occasioned by the greatly increased quantity of the blood, its quality being in no way impaired. M. Andral† mentions the following experiment, as proving that general hyperæmia may produce dropsy. If in living animals we increase, artificially, the mass of blood, and keep the vessels for some time distended, not only serous effusion takes place, but the absorption of fluids already effused will likewise be diminished. If, under these circumstances, a vein be opened, and the quantity of blood diminished, the effusion soon disappears, and absorption resumes its usual activity.

The researches of Dr. Bright,‡ Dr. Bostock,§ and Dr. B. Babington, would indicate that, when dropsy is combined with an albuminous state of the urine, which is evinced by its coagulating on the application of heat, the blood is deprived of a large proportion of its albumen, while another change takes place in it under these circumstances, it contains urea, the proportion of which substance is diminished in the urine. It would appear, however, from the analyses of other chemists, that though the pro-

* Clinique Medicale, tome 3.
† Andral's Pathology, v. 1, p. 398.
‡ Bright's Hospital Reports, vol. 2, p. 447.
§ Bostock's Physiology, vol. 3, p. 413.

portion of albumen in the blood may be generally diminished when albumen is found in the urine, this change does not always take place.

Certain poisons appear, also, to produce some change in the blood, favourable to dropsical effusion, though in what that change consists, we are, at present, unable to decide.

The bite of venomous reptiles is frequently followed by dropsical effusion, the blood, at the same time, losing the power of coagulation.

In *chlorosis,* the altered appearance of the blood has been noticed by many writers, but, so far as I am aware, no analysis of it has hitherto been published. When I have had an opportunity of observing blood abstracted during this disease, it has uniformly presented a watery consistence. On looking at the small quantity remaining on the lancet, the globules have appeared to float loosely in the serum, and to be present in much smaller proportion than is natural. When coagulated, the crassamentum has been exceedingly small and thin, and not unfrequently buffed.

The following table shows the composition of blood taken from two chlorotic patients, who presented well marked symptoms of the disease. The first was from a girl, 15 years of age, who had never menstruated, and had neither developement of the breasts, nor any other appearance of puberty. The second was taken from a young woman, æt. 21, who had always been very irregular in her menstruation, and had not menstruated for three months previous to the time I bled her.

Comparative table, showing the constituents of Blood in Health and in Chlorosis.

CONSTITUENTS.	Healthy standard of Lecanu.	Chlorosis. Female, æt. 15.	Chlorosis. Female, æt. 21.
Water, ...	780.145	871.	852.
Fibrine, ...	2.100	5.	3.
Albumen, ...	65.090	60.	78.
Fatty matter, ...	3.740	1.7	2.
COLOURING MATTER, ...	133.000	48.7	52.
Animal extractive matter,...	3.055	3.	2.
Alkaline salts, ...	8.370	7.6	7.
Earthy salts,...	2.100	1.8	2.
Loss, ...	2.400	1.2	2.
Total, ...	1000.000	1000.0	1000.
	Serum. Clot.	Serum. Clot.	Serum. Clot.
Proportion between serum and clot, ...	10 + 13	10 + 4	10 + 4

On inspecting the above table, the first thing we notice is the diminished proportion of crassamentum to serum, it being less than one-third the healthy average. This diminished proportion of clot, we perceive, on further inspecting the table, to result from the diminished proportion of colouring matter. In one analysis, the colouring matter was only one third its healthy proportion, and in the other but little more.

Mr. Brande* states that menstrual blood consists of a concentrated solution of colouring matter in diluted serum, and here we find a diminished proportion of colouring matter in the blood, attended with suspended menstrual secretion. The colouring matter of the blood is the portion from whence we obtain the iron. If the colouring matter be diminished, the proportion of iron must be diminished also. The administration of iron proves the most effi-

* Philosophical Transactions, 1812, p. 113.

cient mode of restoring menstruation. Can it, then, be doubted, that in chlorosis, menstruation is suppressed, from the absence of sufficient colouring matter in the blood to supply the secretion, while the administration of iron restores menstruation, by first increasing the proportion of colouring matter in the blood. The appearance of a buffy coat in chlorotic blood, has frequently attracted my attention, from its appearing where no symptoms of inflammation were present. On examining a clot under these circumstances, I have found it to contain as much as 20 parts of fibrine in every thousand, or six times the healthy proportion. Yet further examination has proved its proportion to the entire mass of blood, not to exceed the healthy standard. The very small proportion of clot to serum, occasions the large proportion of fibrine in a given weight of the clot, while the small quantity of colouring matter it contains, subsiding to the bottom of the clot, leaves its surface buffy. This shows the necessity of examining not only the proportion of fibrine in a clot, but also its general proportion to the entire blood.

In amenorrhœa I have not found the blood to present a character similar to that of chlorosis.

Scurvy is another disease in which the chemical character of the blood undergoes a marked alteration, which alteration is evidently the cause of most of the symptoms present. In this disease we find the blood transuding spontaneously through the tissues of the body, occasioning hæmorrhage from the gums, effusions of blood beneath the skin, and bloody discharge from the bladder and bowels. If from any injury bleeding takes place, it is with great

difficulty stopped. After death, the blood is fluid and uncoagulated, so that, on puncturing a moderately large vein, the whole of the blood from the adjacent parts may readily be drawn away. When drawn from a vein, the blood is thin and watery, and does not separate into serum and crassamentum. It thus appears that, in scurvy, the blood looses its power of coagulation, and becomes permanently fluid, and of a more watery consistence than in health. This permanently fluid state of the blood succeeds to the use of salted provisions for a considerable period, and some authors have gone so far as to state that, by persisting in the employment of such provisions, it may at any time be produced. The addition of salt to the blood, we know, from every day observation, renders it permanently fluid. It is constantly added to blood, with this intention, for culinary purposes. It is, therefore, not too much to assume that, in scurvy, the blood is rendered permanently fluid, by the excess of salt carried into it from the continued use of salted provisions. We know, also, that the administration of acid is the most effectual remedy for the disease, restoring to the blood its lost power of coagulation. We know, too, that acids instantly coagulate the blood, and, in consequence of their possessing this property, constitute the basis of most of our styptic applications.

Taking these facts in connection, we may safely conclude that scurvy is occasioned by an excess of saline matter in the blood, depriving it of the power of coagulation, and that acids cure the disease by restoring its coagulating power.

The blood of *Cholera* patients has been carefully analysed by several eminent chemists. M. Herman,* of Moscow, M. Lecanu,† Dr. O'Shaughnessy,‡ and Dr. Wittstock,§ of Berlin, all agree in considering a diminished proportion of water, and consequent increased proportion of solid matter in the blood, as the principal alteration it undergoes.

According to M. Lecanu, the quantity of solid matter in the blood of cholera patients, is sometimes twice the healthy proportion. This thickened state of the blood renders its separation into serum and crassamentum very imperfect, and, consequently, occasions the examination of the serum to be very difficult.

Dr. O'Shaughnessy and Dr. Wittstock both observed that the serum ceased to show alkaline properties on the addition of turmeric, and they both state the specific gravity of the serum to be greatly increased, 1040 being about the average, while the healthy standard is only 1028. Dr. O'Shaughnessy likewise states that, in malignant cholera, the proportion of alkaline salts in the blood is greatly diminished, and that the carbonate of soda almost entirely disappears. At the same time that the blood is deprived of its water and alkaline salts, the evacuations contain exactly what the blood has lost. From the analyses of Dr. Wittstock, it seems that the evacuations consist of water, containing, in solution, a large quantity of alkaline salts, and a small

* Journal de Chimie Medicale, Nov. 1831.

† Journal de Pharmacie & Medico-Chirurgical Review, April, 1833.

‡ Report on the Chemical Pathology of Malignant Cholera.

§ Gazette Medicale, Oct. 19, 1833, and Lancet, Oct. 1833.

quantity of albumen, and other organic substances. The same constituents, in fact, which are absent from the blood.

Dr. Herman attributes many of the phenomena of cholera to the presence of uncombined acetic acid in the blood, and Dr. Clanny supposes free carbon to exist in large proportions in the blood of cholera patients, and to exert a powerful influence in the disease. Other analysts, however, deny the existence of either the acetic acid of Dr. Herman, or the free carbon of Dr. Clanny, in either healthy or morbid blood.

From the necessity for bleeding in *scrofulous* subjects occurring so seldom, we have no recorded analyses of blood in this disease that I am acquainted with; our knowledge of its chemical constitution is, therefore, very imperfect. We have, however, abundance of evidence, to induce us to suppose that an altered state of the blood is one of the most important changes present in this disease. Mr. Thackrah's experiments on the proportion between the serum and crassamentum in different affections, would lead us to conclude that the latter is diminished in scrofulous subjects.

In the few cases where I have had an opportunity of examining such blood, the proportion of serum to the crassamentum has been increased considerably; the crassamentum, at the same time, being less firm than natural, probably from the fibrine being diminished in quantity. It may be doubted what importance, in scrofulous disease, should be attached to the altered condition of the blood. It would be as unphilosophical to consider it the *sole* cause of all

the symptoms presented in scrofula, as is the theory of those who assign it solely to an affection of the glandular system; or of others who can see in it nothing but the results of a disordered state of the digestive organs.

In scrofula the digestive organs, the glandular system, and the circulating fluid, all become affected, and their affections induce numerous morbid phenomena, which aggravate the disease, and may be relieved by rectifying the particular affection; but he who wishes to take a correct view of this disease, must not confine his attention to one organ or one system.

It is probable that an altered condition of the blood, is an early and important change induced by scrofula, and the cause of many of the phenomena presented by the disease. According to Dr. Carswell,* tubercle is never secreted until an altered condition of the blood has taken place

We have daily before our eyes, instances of scrofulous symptoms disappearing, on an altered state of the blood being induced. When scrofulous disease is making the most rapid progress, if the patient be a female, and become impregnated, the symptoms of the disease almost invariably disappear; a state of health previously unknown is induced, which continues until after delivery, when the symptoms again appear, and the disease proceeds, probably with increased rapidity, to a fatal termination. In what way is this check given to a disease so formidable? Why does pregnancy check the progress of scrofula?

* Carswell's Illustrations of the elementary forms of Disease.—Art. Tubercle.

I can account for it but in one way. During pregnancy the blood undergoes important changes. It contains an increased proportion of crassamentum, and particularly of fibrine; indeed, a state of blood diametrically opposed to that which exists in scrofula is induced, and, as long as this state of blood exists, so long is the progress of the disease checked.

In *Carcinoma* there is good reason to believe that the carcinomatous matter is first formed in the blood, and then deposited in the molecular structure of organs, in the same manner as the nutritive element of the blood, or is poured out on free surfaces on serous membranes, in a manner similar to the natural secretions.

This view of the subject is supported by Dr. Carswell,* who brings forward the following facts in support of this opinion.

1st. The presence of carcinomatous matter in the vessels which ramify in carcinomatous tumours, or in their immediate vicinity.

2nd. Its presence in the vessels of the whole of an organ, when this substance is exclusively confined to a part.

3rd. Its presence in vessels having no direct communication with an organ affected with the disease.

4th. Its being found in blood which has been effused into the cellular tissue and on the surface of organs.

That the presence of an organized product in the blood can have no other origin than the blood itself, and that such a product cannot be introduced into this fluid by absorption, or otherwise, are facts, in Dr. Carswell's opinion, sufficiently obvious.

* Illustrations of the Elementary forms of Disease—Art. Carcinoma.

The matter of *Melanosis* is also found in the blood, and under circumstances which leave little doubt of its having been formed there. Some persons have supposed this disease to arise from the accumulation in the blood of the carbon which is employed to colour different parts of the body, as the hair, rete mucosum, and choroid, and the circumstance of its more frequent occurrence in the grey horse, than in the brown or black, countenances such an opinion. The chemical composition of melanotic matter also favours this theory. M. M. Lessaigne, Foy, and Barruel, in France, and Dr. Henry, of Manchester, have analysed melanotic matter. M. Barruel* states that melanosis, in man, is composed of the colouring matter of the blood, united with fibrine, (both in a peculiar state,) fatty matter, and phosphate of lime and iron. M. Foy† gives the following as its composition in the horse :—

Albumen,	15.00
Fibrine,	6.25
A highly carbonized principle, probably altered cruor,	31.40
Water,	18.75
Oxyde of iron,	1.75
Subphosphate of lime,	8.75
Muriate of soda,	3.75
——— of potash,	5.00
Carbonate of soda,	2.50
Carbonate of lime,	3.75
Carbonate of magnesia,	1.75
Tartrate of potash,	1.75

We may, from these analyses, safely conclude that melanotic matter is composed of the same es-

* The details of this analysis will be found in a Memoir on Melanosis, by M. Breschet.

† Archives de Medecine, June, 1828.

sential constituents as the blood, which conclusion is further supported by M. Foy, who states that the colouring matter which gives to melanosis its peculiar character, is a highly carbonised principle, very analogous to the colouring matter of the blood.

The serum of the blood presents, not unfrequently, a milky appearance. This *milky serum* has attracted considerable attention, and though it does not appear to be a diseased state of the blood, cannot well be passed over without notice in this report. Chemists generally agree in attributing this milkiness to an excess of fatty matter, mechanically suspended in the serum, and Dr. Marcet* states that it occurs much more frequently in animals feeding entirely, or chiefly, on animal food, than in those which feed upon vegetables. He has observed this appearance of blood in three diabetic patients, who were living entirely upon animal food; whilst in a fourth, whose diet was not so strictly attended to, the serum was not milky. This character of blood has been supposed, by many, to be more frequently present soon after meals, than at any other time, and to be occasioned by more chyle being thrown into the blood than can be immediately assimilated; and I have, myself, generally met with it in persons who had partaken freely of animal food, a short time previous to the blood being abstracted.

There can be little doubt but specific changes take place in the blood, in small-pox, measles, scarlet fever, syphilis, and numerous other affections. As chemistry, however, has failed, at present, to detect

* Marcet on the Analysis of Chyle. Medico-Chirurgical Transactions, vol. vi. p. 624.

these alterations, any further remarks respecting them, in this Report, would be misplaced. Whether chemistry will ever be able to appreciate the morbific matter producing these affections, may, perhaps, be doubted; and whether the action of such morbific matter will cause the appearance of new products in the blood, or only occasion changes in the proportions of its normal constituents, inconsistent with a state of health, future experiments alone can determine. The examination of this subject presents, however, a fruitful field of inquiry to the diligent and persevering student of our profession, but without both these qualities, in no ordinary degree, let no man hope to acquire reputation in the cultivation of pathological chemistry.

Dr. Christison,* in his excellent work on Poisons, has recorded numerous unequivocal instances of the detection of *poisons in the blood.* When we consider the numerous impediments which exist to the detection of poisons in this fluid, from the small quantity necessary to destroy life; from the probability of a part or even of the whole of the poison absorbed having been thrown off in the excretions, and from the difficulties of the analysis, it is not surprising that, in numerous instances where its existence is probable, chemical analysis has been unable to detect it. M. Grognier,† of Lyons, found sal ammoniac in the serum of horses poisoned by it; verdegris and sugar of lead were found in the blood of the veins by Gmelin and Tiedmann;‡ Lebkückner§

* Christison on Poisons, p. 13.

† Corvisart's Journal de Medecine, xix. p. 155.

‡ Nouveau Journal de Medecine, x. p. 469.

§ Diss. Inaug. Tubuigæ, 1819, p. 9.

detected camphor in the blood of the vena cava; hydrocyanate of potash was discovered by Meyer,* in the blood of animals poisoned by it; Dr. Cantu,† of Turin, has detected iodine in the blood of persons using it medicinally, and Krimer‡ has discovered hydrocyanic acid in the blood of persons poisoned with it. These facts render it undoubted that poisons enter the blood; whether it be through that medium, or through the nervous system that they produce their poisonous effects, is a matter of dispute. Dr. Christison,§ who, however, supports the latter opinion, gives the following arguments in favour of the former.

1st. Poisons disappear during life from the shut cavities into which they have been introduced; that is, they are absorbed.

2ndly. Many poisons act with unimpaired rapidity, when the nerves supplying the part to which they are applied have been previously divided, or even when the part is attached to the body by arteries and veins only.

3rdly. Many poisons will not act when they are applied to a part of which the circulation has been arrested, even although all its other connexions with the body have been left entire.

4thly. Many poisons act with a force proportional to the absorbing power of the texture with which they are placed in contact.

5thly. It has been proved that if the extract of nux vomica be thrust into the paw of an animal,

* Journal Complementaire, xi p. 22.

† Journal de Chemei Medicale, xxvii, p. 244.

‡ Journal Complementaire, xxviii. p. 37.

§ Christison on Poisons, p. 8.

after a ligature has been tightened round the leg so as to stop the venous, without stopping the arterial, circulation of the limb, blood drawn from an orifice in a vein between the wound and the ligature, and transfused into the vein of another animal, will excite in the latter the usual effects of the poison, so as to produce death; while the animal from which the blood has been taken will not be affected at all, if a sufficient quantity is withdrawn before the removal of the ligature.

Although the above facts may not be sufficient to prove that poisons produce their effects through the blood, they are amply sufficient to prove that they are absorbed, carried into the adjacent veins, and enter into the blood. Whether they subsequently produce their effects through a peculiar expansion of nervous filaments on the inner surface of the vascular system, or are conveyed by the blood into the minute structure of the organs acted upon, will, probably, for some time, be a matter of dispute.

When we find poisonous substances entering the blood, and, probably, in some way, exerting their influence through this medium, we are naturally led to inquire whether our remedial agents do not produce their effects through the same channel. The researches of Dr. Prout would induce us to believe that both alkalies and mineral acids are carried into the blood, and through it produce their effects on the urinary secretion. He has shown* that when the lithic-acid diathesis exists, and the urine is constantly acid, high coloured and concentrated, repeated doses of alkalies, or their compounds with vegetable acids,

* Prout on Urinary Diseases, p. 292.

will not only render the urine alkaline, but keep it in that state so long as they are employed.

In some cases of dropsy where the urine is albuminous, in which case it is also acid, the urine ceases to present the albuminous character after the patient has for a short period taken alkaline medicines. It would appear from experiments mentioned by Dr. G. Burrows* in his Gulstonian Lectures for the present year, that when alkalies are added to urine in which the albumen has been coagulated by heat they possess the power of redissolving it, and if added to albuminous urine before exposure to heat, the albumen is not coagulated when heat is applied. He is, therefore, disposed to assume that alkalies, when administered to persons having albuminous urine, produce their effect by rendering the albumen more soluble, which prevents its being detected by the application of heat. He also attributes the well known effect of alkalies in promoting absorption, to their acting on the parts to be absorbed as they act in the kidneys and out of the body, namely, to their rendering the parts more soluble, and, consequently, more readily absorbed.

The mineral acids, which the stomach appears to be incapable of decomposing, present a class of medicines which have long been much esteemed by physicians. Their action on the blood, when removed from the body, is exactly the reverse of the action of alkalies; they directly coagulate the albumen it contains, and render it solid. When taken medicinally, it is probable that their effects on the blood are similar to those produced out of the body. In

* Medical Gazette, July, 1834.

scurvy, passive hæmorrhages, leucorrhœa, and other fluxes, they are found most efficient, and are so probably from their increasing the tendency of the blood to coagulation. That they enter into the blood, and pass through it undecomposed, is evident from their immediately altering the alkaline character of urine, when administered to patients presenting the phosphoric diathesis.

Mercury undoubtedly enters the blood when taken medicinally. Dr. Colson* detected it by introducing plates of polished brass into the blood, which became covered with a coating of mercury, and we learn from Dr. Christison that it has been obtained from the crassamentum of persons salivated, when no mercury could be detected in the serum. It has already been shown that iodine enters the blood, and as we know that neither iodine nor mercury produces its respective effects on the constitution until its use has been persisted in for some time, we may conclude that it is through the medium of the blood that they act upon the animal system.

From what has been already stated on the subject of chlorosis, there can be little doubt but iron produces its good effects in that disease, by first altering the character of the blood, and in other affections it is probably through the same medium that it acts.

Now we are so well acquainted with the importance of the saline matter of the blood, we may, perhaps, be induced to attribute some of the good effects produced by a course of mineral waters, to the introduction of the saline matter they contain into that fluid. Though great allowance must be made

* Revue Medicale, Jan. 1828.

for the effects of change of air, relaxation from business, change of habits, and other incidental circumstances, yet all candid observers must acknowledge, that when due allowance has been made for all these circumstances, a large residuum of cases remains where the most surprising good effects have been produced by a course of mineral waters. From the effects generally produced by them on the kidneys, it is evident that a large portion of the water is absorbed, and it is probable that their good effect is to be attributed as much to the alterations they produce in the chemical character of the blood by entering into its composition, as to the increase they occasion of the secretions of the bowels. My own observations and analyses would favour this opinion, but they are, at present, too few to enable me to express any decided opinion on the subject.

From the facts collected in this Report, we may conclude, 1st. That in many diseases the blood has been proved to undergo material alterations in its composition, and in numerous other affections there is good reason to suppose such changes to take place. 2ndly. That many of our medicines enter into the blood, and probably produce their remedial effects through that medium.

Our knowledge of what medicines act by producing changes in the blood, and what, by other means, is at present very imperfect. Some have been pointed out which undoubtedly enter that fluid, and probably through it produce their effects. Others again, as the salts composed with vegetable acids, and the large class of medicines taken from the vegetable kingdom, are some decomposed, and others digested in the stomach. A third class, the

sulphates and phosphates, the stomach possesses no power over; they are not decomposed by it, and mostly pass off by the bowels, on which they produce a purgative effect.

With respect to the changes which exist in the blood in different affections, much difference of opinion may exist as to the importance of these changes. Many of them, no doubt, may be considered as results only to be removed by removing some antecedent disease; but many others take place so early in the affection, and are so evidently the cause of the consecutive symptoms, that no improvement can be looked for without first altering the character of the blood. He would be an unsound philosopher who should confine his attention to the sanguineous system in disease, but he would be equally unsound who should neglect it, or not give to it an equal importance with the alimentary and nervous systems. He who would form a correct estimate of disease, must not be satisfied with a knowledge of the state of one fluid only, whether that be the blood, the biliary, the gastric, or the urinary secretion; nor must he confine his attention solely to the state of one organ, however important its functions. In disease, as it presents itself to our observation, we seldom find one system alone affected. The sanguineous, the nervous, and the digestive, may be, and frequently are, all affected in the same individual. No one system can be long disordered without inducing disorder in others, and to decide which system is primarily, and which secondarily, affected, is at once the most important and the most difficult problem the medical practitioner is called upon to solve.

A REPORT

ON THE PRESENT STATE OF OUR

KNOWLEDGE OF ANATOMY.

BY THOMAS TURNER, M. R. C. S.

Lecturer on Anatomy and Physiology; Surgeon to the Manchester Royal Infirmary, &c. &c. &c.

INTRODUCTION.

It was suggested by Dr. Hastings, the enlightened founder of the Provincial Medical and Surgical Association; and enforced by Dr. Barlow, the learned author of the "Retrospective Address," read at the First Anniversary Meeting of the Society held at Bristol last year, (1833,) "that it would be expedient to follow the example of the British Association for the advancement of Science, by proposing, each year, particular topics of inquiry, and deputing competent individuals, or small sub-committees, to collect information, and furnish reports on them at subsequent meetings."

In accordance with this suggestion, the first subject proposed was "the present state of our knowledge of anatomy;" and Dr. Kerr, of Northampton, and myself, were nominated to prepare a report on this fundamental and highly important branch of medical science; but as Dr. Kerr was induced, by

reasons flattering to me, to decline his share in the undertaking, the whole of the arduous duty became my own; a circumstance which materially increased the regret which I originally felt, that the task was not entrusted to abler hands than mine, even as coadjutor with that intelligent individual. It might, however, be construed into mere affectation, if I were to commence my labour with the plea of not having attended to the subject, since my avocations and duties as a teacher, have familiarized me with anatomical pursuits; and my natural taste and early associations have led me to cultivate them from the outset of my professional career. "The present state of anatomy," however, comprehends so much in one grasp, as to astound the mind, since no branch of science has undergone greater revolutions, and been more extended of late years, than anatomy; and amidst the numerous works and papers that have issued from the press on this important subject, I found myself so overwhelmed, as scarcely to know where to begin, or where to terminate, the inquiry. In collecting and arranging materials with a view to my report, I found them so voluminous as to preclude the possibility of such a condensation of them, as would enable me to compose, in a satisfactory manner, a written address, that could be read within one hour and a half, the length of time which I proposed to occupy in its delivery; and, therefore, for the sake of brevity, I adopted the *vivâ voce* method of communicating the principal facts which formed eras in anatomical history. It was impossible, however, in the prescribed time, that I could, *in any way*, do full justice to the subject of my report;

or give due honour to the authors of the various discoveries and improvements that have been made in the science of anatomy, even during the present century, on which account I at first objected to the immediate publication of it, but the reiterated request of the members of the association, that I would publish it, and that, too, in the *next* volume of their Transactions, left me no alternative but to consent. I therefore offer it to the reader in its present condition, with the hope that it will, at least, prove serviceable, by directing him in his researches to the best and most valuable sources of public information; but I must claim indulgence for the language of this report, (which time would not allow to be the result of deliberate study,) and for my not having made honourable mention of *all* who have distinguished themselves by their contributions to anatomical science; but I hope to remedy both these defects at no very distant period.

Report.—Before we enter on our inquiry into organization and structure, it is necessary to settle (as far as we can do,) the subject of Life. The nature of the vital principle is a question that has much occupied the attention of physiologists, from the time of Hippocrates to the present hour; and yet we are not one single point nearer the true solution of the question, in referring it to electricity, (the fashionable doctrine of the day,) than Hippocrates was, who believed life and organization to depend on the element fire. There is an innate propensity in the human mind, not to rest satisfied with effects, without endeavouring to investigate the causes which produce them; but if facts or evidence were wanting

to prove that there is a barrier between what we shall, and what we shall *not* know, it will, I think, be found in our ignorance of the *essence* of life; for, notwithstanding the exercise of the most skilful ingenuity and the best-directed researches, we know nothing more than that life is life—that it must exist in a passive state, and in an active state; that to its existence in an *active* state, organization is necessary; that it is characterized by certain functions, for the manifestation of which, certain organs are requisite; and, although, *in its active state,* life is inseparable from organization, *organization is not life.* Finding the difficulties with which the subject is encompassed, physiologists have had recourse to various analogies, in order to explain their ideas of the principle of life; and electricity has been selected as adequate to this purpose. Hunter accounts for the phenomena of vitality, by supposing them to be allied to the electric fluid; and Abernethy so far agrees with Hunter, as to say, that if life be not electricity, at least, there is reason to believe, that it is of a similar nature, and possesses the power of regulating electrical operations. But Dr. Prout, who naturally would feel inclined to yield the preference to any agent connected with his favourite science, chemistry, has rebutted the opinion that electricity and the principle of life are in any way analogous; and believes that no law in chemistry will ever elucidate, not even remotely, the phenomena of the vital principle. It is to be apprehended, I think, that the ultra-chemical notions, so prevalent in the present day, are doing mischief, by leading us to rely too confidently on the specious explanations which

they seem to furnish, of obscure animal functions. The science of chemistry can accomplish much when applied to the *inorganic* part of nature; but it is quite insufficient to explain the laws of the vital phenomena. The celebrated Chaptal, in his Elements of Chemistry, speaks of the imperfect success of that branch of the science, which has for its object the study of man. "Chemistry," he remarks, "can perform every thing in the mineral kingdom, because every thing there depends on the laws of affinities; but, in the kingdom of organized beings, the science is subordinate to the laws of the economy of living bodies; and its results can only be affirmed to be true, when confirmed by observation." No definition, as yet advanced, of the essence of life, can, in my opinion, be received as satisfactory; the same remark applies to the definitions which have been given of galvanism, magnetism, and other natural agents; we recognise these by their laws, as we know life by its laws; and this is the fullest extent of knowledge that we can ever attain, or, indeed, hope for.

In reflecting on the vital principle, it is impossible to neglect the study of it, in reference to the vegetable and animal kingdoms at large; and to its gradual, but progressive, development in the complexity of its properties, as observed in the scale of objects, from plants to man. Although much has been accomplished by the labours of physiologists, all attempts have hitherto failed to unravel certain intricacies with which life and organization are surrounded; we admit, as Aristotle did, "that in the scale of material existence, plants immediately suc-

ceed to lifeless forms of matter; that plants represent a middle term between animals and all other bodies; and that the change from the vegetable to the animal nature, is as gradual as that from inanimate to vegetable matter." In a word, on the perplexing question of life, our present knowledge resolves itself simply into this fact, as Aristotle told us long ago, "that different bodies partake, in different degrees, of life, and, accordingly, they differ, the one from the other, in the degree of activity of the functions of life;" thus, there are grades *of vitality*, and those not only in the scale of organized beings, but, also, in the fluids and tissues which enter into the composition of each organized body. The theory of Bichat on the subject of life, has much influenced the opinions of physiologists, and although, in his views, he has doubtless fallen into some errors and inconsistencies, yet, as pointing out certain fundamental distinctions between the life of vegetables and that of animals, they are, generally, correct, and well worthy of attention. The essential doctrine of Bichat's Theory of Life, is, that there is no one individual presiding principle of vitality, which animates the body; but, that it is a collection of matter, gifted, for a time, with certain powers of action, combined into organs, which are thus enabled to act; and that the result is a series of functions, the connected performance of which constitutes it a living being. In carrying the examination further, Bichat points out two remarkable modifications of life, the one being common to vegetables and animals, and the other peculiar to the latter; vegetables can exist by themselves, or are dependent

on the material world for the means of nutrition; but animals, in addition to this internal life, possess another, by which they are connected with objects about them, and are linked to them by the ties of mutual dependence. This fact affords a principle, on which the French physiologists founded a distinct classification of functions; those which are possessed in common with vegetables, are called the functions of organic, or automatic life; and those, on the other hand, which are peculiar to animals, and which, in them, are superadded to the possession of the organic functions, are named the functions of animal life. Physiologically speaking, then, we have two lives; by one life the different parts of the body are kept in a state of repair; by the other we are rendered moving and sentient beings. These remarks will serve to convey to the reader a brief notion of Bichat's Theory, and of the fundamental distinctions. which that eminent physiologist endeavoured to establish, between vegetable and animal life. But, it is obvious, Bichat wished it to be understood, that organization and the vital principle are one and the same thing, which certainly must be considered as an incorrect opinion. It is true, there is a close, and, indeed, an inseparable connection between the two in *active* life; thus, when once roused from its state of passiveness, life cannot be maintained without the aid of a set of instruments or organs, which are endowed with such physical and vital properties, as will subserve to the supply of the nutritive wants of the individual, by converting aliment into a fluid, which is capable of repairing the waste continually taking place in the living

body. All physiologists agree, that perpetual change is the fundamental and immutable law of organized beings; for deposition and absorption, the former for the renewal of organic materials, the latter for the removal of the old, are two functions which cannot be separated from our ideas of life, as they co-exist, equally, in the simple vegetable, as in the compound animal. The superadded functions of vegetables are extremely simple, in comparison with those of animals, since the latter alone possess the means of moving from place to place; a few species excepted, which, during the whole period of their existence, are fixed to the spot which gave them birth; animals, also, possess sensation, volition, and such other endowments as are requisite, to enable them to hold necessary relations with external objects. But vegetables, like animals, have the means of continuing their kind, to succeed to those that die; and the very operations which maintain life, are those which, in the natural course of events, ultimately induce its termination.

The natural life of man embraces various ages or periods; and many of these periods are characterized by certain structural and functional changes, and by peculiar morbid tendencies; but, for our present purpose, it will be sufficient to observe that, in viewing life from the state of uterine existence, down to the utmost span allotted to man, we find a field of inquiry replete with interest and instruction. To mention a single fact; who, for example, can be acquainted with the fluidity and softness of textures in infancy, without associating with the circumstance such a condition as is favourable to nutrition and growth?

And who can witness the predominance of rigidity in the solid parts, in advancing and advanced age, without being led to regard this change as the precursor of decay and death? It is obvious, then, that the very actions which contribute to, and which, indeed, are essential to the maintenance and continuance of life, are the very sources of its destruction, for the absolute condition of animal existence is its termination in death; when the vital spark has fled, the body becomes subject to chemical laws; the elements of organization are returned to the storehouse of nature; and the fabric they once composed loses its original form and character, and crumbles into dust.

Organization.—However much at variance physiologists may be as to the essence of the vital principle, few will presume to deny that organization is positively necessary to the existence of *active* life. It may admit of doubt, whether a seed, or an egg, be an organized body, according to the way in which anatomists may choose to interpret the term organization; but all agree in believing, that both the seed and egg possess the living principle, which, when excited to action by the appropriate stimulus, will give rise to a process, or processes, by which is accomplished the formation of those organs, and apparatuses, which are essential to the manifestation of active life. There is, indeed, no *positive* proof that a seed and an egg have life, until they are exposed to the influence of soil and temperature, which have the physical effect of bringing about those changes that are necessary to the developement of a new plant or a new animal. Meckel, and other physio-

logists, have directed much of their attention, of late years, to the subject of embryogeny; and the following is to be considered as an established principle in the laws of organization. It is believed that all the structures which compose an animal, must pass through many stages before they arrive at perfection; and the investigations of Meckel and Beclard have led to the important and interesting fact, that the degrees of development through which man passes from his first origin, until the time of his perfect maturity, correspond to permanent formations in the series of the animal kingdom. The human embryo is, at first, an imperfectly-formed vesicle—such are the polypi and other zoophytæ; at a later period, it consists of a small vermiform body without a distinct head, or limbs—such are the echinodermata and annelides; at a still later period its limbs are equally developed, and its inferior parts are prominent, resembling a tail—such are the quadrupeds. The same correspondence is also observable as it respects the nervous system. The ganglial or vital nerves first appear with their ganglions—such is the nervous system of the invertebrata; as the embryo advances, the ganglial nerves are said to give rise to two strips of medullary matter in the situation of the spinal canal; these strips increase, coalesce, and form the spinal marrow, medulla oblongata, and the tubercles of the latter, whence are produced the brain and cerebellum; and the same conformation is to be observed in reptiles, fishes, &c.: thus the human fœtus is first a vesicle; it next resembles a worm; and then, in some respects, it is like a quadruped; but it is re-

markable for the rapidity with which it runs through the grades in the scale of organization, on which account it is difficult to recognize the early changes which its body undergoes. In the first instance all is fluid, and out of fluids the solids emanate: every bone, one of the hardest and most durable of structures, exists, originally, in a fluid state; but earthy materials are added by the secretive functions of the blood-vessels, and thus the organ, by degrees, acquires that consistence which characterizes osseous tissue. The remaining laws of organization are, 1st, that the form of the parts is more rapidly developed than the consistence, internal texture, and chemical composition; 2ndly, that all the parts of the body do not appear simultaneously, but in a successive order; 3rdly, that the growth of each organ proceeds from the circumference towards the centre, and not in an opposite direction, as was formerly supposed to be the case; and lastly, it has also been ascertained that, at first, each organ is double, but that, as the process of increase advances, the two lateral halves are joined together, so as to obliterate all traces of the original division.

These laws of organic development may now be considered as fairly established, for a little reflection will furnish us with illustrative examples of each; with respect to the first law, bone exemplifies it; with regard to the second, observation on the development of the chick, *in ovo,* teaches us that some of the nerves and the spinal marrow first show themselves, and these appear about the 15th hour after incubation: the cerebrum is visible about the 30th hour: the blood-vessels appear about the 36th hour:

the heart is observed to beat towards the end of the 2nd day: the liver becomes apparent at the end of the 4th day; and the stomach and other digestive organs, about the 5th or 6th day; about this time, also, appear the lungs and cerebellum, which last organ seems to spring from the lateral parts of the spinal marrow.

With respect to the 3rd law above stated, it is exemplified in the brain and other organs; the cerebrum, first, consists of vesicles, which are found to correspond with the lobes of the brain, and to become solidified from the circumference towards the centre; and, lastly, to such an extent is the law carried "that each organ is double;" that even the intestinal canal, in its origin, consists of two halves, which are afterwards joined, so to complete the cylindrical form of the gut.

I have stated that the nerves and spinal marrow are the parts which first appear, a fact which we shall now consider in connexion with the influence of nervous energy on organic development. This subject has, of late years, occupied the attention of physiologists, but more especially of Tiedemann, who has published a paper on it in his Physiological Journal. This writer has shown that the nervous system is most importantly implicated in organization, and he has established an interesting theory on the connexion between deficient development of the nervous system, and of the extremities in monsters. He gives examples of defective formation of the spinal cord with deficiency of limbs, and on the other hand, of excessive formation of the brain and nerves, with supernumerary organs. In fine, Pro-

fessor Tiedemann concludes that the nervous system, as the first existing apparatus, regulates the development of the embryo, and determines the peculiar form and disposition of its organs.

More, very much more, might be added to this sketch of organization; a subject involving facts of the greatest interest to the philosopher and physiologist, but time will not allow it. I may observe, in conclusion, however, that the first materials on which animal life operates, are furnished by the female parent, and exist in the form of a fluid enclosed in a delicate and transparent membrane, affording no trace of organization, or, even, of vitality; but, on the application of the appropriate stimulus, circulation and action commence; secretions take place from the blood or some analogous fluid; development and growth proceed, and, at length, the animal energies form its fœtal existence. The aid of the microscope may be employed with advantage, to observe the series of changes which occur during the organizing process; but there is a plan, and an intelligence, operating in this wonderful power of the animal economy, that no glass can reach, and which can only be understood by the Great Author of the universe. But, is the process of organization complete at birth? Does our interest in the subject terminate here? Certainly not. At birth, the animal is imperfect, for the organs which compose it have to undergo a great variety of changes, before they can be said to have arrived at their full completion. The brain, the liver, the kidneys, and other viscera in a child, can scarcely be identified with the same organs at adult age. It is not until the period be-

tween the 30th and 40th year, that man can be said to have attained his meridian, since it is not till then that his body has reached perfection in all its parts.

On the human body.—If we proceed with an analytical and chemical examination of the human body, we shall find it to consist of certain constituents or elementary principles, which, when combined, form certain compound or immediate principles of organization; and of these the various fluids and solids of the body consist.

Fluids.—The fluid parts of the body are the chyle, blood, lymph, and secretions from the blood: each of which deserves a separate consideration so far as its composition and use in the economy are concerned; but as Dr. C. Henry and Mr. Jennings are deputed to draw up a report on the "Animal Fluids," I shall confine myself to a few general remarks upon them.

Chyle, the product of digestion, is commonly called incipient blood, not an inappropiate appellation, when we consider that the physical and chemical nature of this fluid does, in most respects, resemble that of the blood itself. Many opinions have been advanced with a view to explain the change of chyle into blood; and the mode by which it obtains its red colour. Dr. Marcet found that, when the globules of chyle were, for a certain time, exposed to the action of the atmosphere, they acquired a pinkish hue; and other physiologists have observed the same thing. Chyle, like blood, is, in my opinion, a living fluid, not, however, whilst in the small intestines, but it is so ere it reaches the point where it is emptied by the thoracic duct into the venous system.

The Blood is the source from whence all the fluids, (the chyle excepted,) and all the solids of the body, are derived; it is, therefore, no matter of surprise, that this fluid should have attracted the attention of physiologists of all ages, and of all countries. It is not necessary to dwell on the composition of the blood, but it will be interesting to examine the question of its vitality. That this fluid is endowed with the living principle, may, I think, be inferred from a variety of circumstances, and this opinion has been more ably and fully substantiated by John Hunter, than by any other physiologist since the time of Harvey. I need not detail the facts which led Hunter to suppose that the blood possesses life, as they must be familiar to the medical reader; but it may be proper to remark that (evident as the statement may appear to be,) the opinion has been doubted by some physiologists. The late Mr. Thackrah proved, by experiment, that a portion of blood received into a dead vessel, is always more speedily coagulated than when it is retained, by ligature, in a living vein, from which he inferred that the vitality of the vessel has an immediate effect on the blood, and retards its consolidation; thus, whilst Hunter contends for the presence of the vital principle in the blood, at the same time admitting that its fluidity is, *in some measure,* dependent on the containing and living vessels, Thackrah, and his adherents, deny, *in totô,* the life of the blood, and ascribe all the phenomena that it presents, under these circumstances, to the influence which the living vessels exert upon their contents.

It is usual for us to connect the idea of the life of the blood with the name of Hunter, an inference drawn from the perusal of his work on the subject, which was published in the year 1794; but, on referring to the volume of Harvey, we shall find that Hunter was not the first to broach such an opinion. When speaking of the phenomena of the incubated egg, Harvey indulges in his usual style of admiration on the properties of the vital fluid, and expresses a belief that the blood is formed, and moved, before any vessel or organ of motion exists; that in it, and from it, not only do motion and pulsation originate, but, also, animal temperature, and, even, the principle of life itself; and that it is, invariably, the first part of the animal that lives, and the last that dies. I have thought it right to make these observations, although not true in all their particulars, in order to shew the antiquity of the belief that the blood is a vital fluid; and that the priority of claim to this statement, must be conceded to Harvey. I do not, however, mean to detract from the merits due to Hunter, or to impeach the honesty of that great man, for it is well known that Hunter was an original thinker and actor, and seldom studied the writings and opinions of other men. No praise of Hunter can be adulation! for, although, as Dr. Barclay observes, he may have been inconsistent on the subject of life, I would eulogise him in the language of that author, and ask, "in other respects, who would not wish to be such a man? In a variety of inquiries more suited to his genius, how few have surpassed him? nay, how few have equalled him? who is there that has done more for the improvement of surgery

than Hunter? who has laboured more for the advancement of comparative anatomy and physiology? and who has left behind him so splendid a monument of skill and industry, as that museum which is now the pride and boast of his country?"

Lymph is the next fluid to be considered. It occupies the vessels called lymphatics, and is composed of serum, fibrine, and some saline ingredients; and it cannot be doubted, but that it contains some of the recrementitious parts of the fluids; as fat, and, even, bile, (an excrementitious fluid,) when absorbed, can be recognized in the lymphatic system.

The fluids, which are secreted from the blood, are very numerous; some of them are destined to be absorbed, and carried again into the circulation, whence they are called recrementitious; but others, again, are carried out of the body, and from that circumstance are named excrementitious. In the scale of vitality of the fluids, the blood ranks first; next the chyle; then the serum; and lastly those fluids which are deposited for specific purposes, and then re-absorbed. The excrementitious secretions, in my opinion, are not endowed with the living principle.

Solids.—The solids, as well as the fluids, are secretions from the blood; it is, therefore, natural to pass from the liquid to the solid parts of the body, which, in their elementary form, exist as tissues; the tissues unite to form organs; the organs apparatuses; and the apparatuses constitute the organismus or perfect body.

Elementary Anatomy.—Elementary anatomy owes much of its present perfection to the labours of

chemists and to the improved state of chemical science. The discovery of the principles of organization has been the result of analytical investigation, but this mode of research has assisted us but little in determining the manner in which the proximate elements are combined and arranged, so as to form the tissues of the body; and even the microscope, which has taught us many interesting facts in minute structural arrangement, and which, in all probability, would otherwise have escaped notice, has failed to furnish us with any positive and precise information on the definite nature of the elementary tissues. The discrepant opinions of physiologists, in reference to the computed size of a globule of blood, shows the uncertainty of the conclusions drawn from this mode of examining elements; as the dimensions given by different observers vary from the 2,000th part of an inch, the size mentioned by Bauer, to the 6,060th part, the estimate of Young: and all the intermediate thousands are given by other physiologists; thus, Dr. Hodgkin gives it as 3,000; Kater 4,000; and Woolaston 5,000. These differences, at least, show, either that the appearances which the microscope presents are not invariably accurate; or, that there is some error in the mode of calculating size; and, whether the one or the other be the true explanation, this fact alone is sufficient to diminish confidence in this instrument, as the means of determining the volume of fluid particles. But the microscope has been an equally prolific source of doubt with respect to the primitive textures; for, whilst Hewson, Home, Bauer, Meckel, Edwards, Dutrochet, Dumas, and Prevost, contend for the existence of

molecules of tissue; Hodgkin, Lister, Cooper, Grainger and others, deny it altogether.

Although the subject of elementary anatomy would seem, from the numerous works that have lately issued from the press, to be a new study, it will be found, on research, that it is not so, since its importance was inculcated by Vesalius, and the works of Haller have, for a long period of time, given to it a high degree of value and interest as a science. This subject, at once so useful and so instructive, was, however, in the Vesalian age, mixed up with many fanciful hypotheses; and Haller, even, has committed himself in speaking of an "invisible rudimental fibre." But since chemistry has lent its aid to anatomy, the real nature of the textures of the body has been cleared up; and the invisible rudimental fibre of Haller has been made to evaporate with the rest of the intangible and volatile ingredients which were supposed, according to ancient doctrines, to be corporeal constituents.

Bonn, of Amsterdam; Cullen, the Hunters, and Smyth, of this country; and Pinel, of France, were, perhaps, the first to place the study of elementary anatomy on a sound and scientific basis; and on the important suggestions and discoveries of these writers, is built the attractive and philosophical system of Bichat. Than Bichat, no anatomist ever laboured more indefatigably, or achieved more; for, although his arrangement of the tissues is not free from objections, it has served as the ground-work of the classifications of Richerand, Dupuytren, Cloquet, Mayer, Meckel, Beclard, Weber, Craigie, and Grainger. I may here remark that the two last-

named authors are the only systematic writers on elementary anatomy in this country, but the plan of their works is different: Dr. Craigie's volume differs from that of Mr. Grainger, in including pathology; and Mr. Grainger's from that of Dr. Craigie, in embracing physiology; but both productions are highly creditable to their authors, and ought to be in the possession of all students and practitioners.

The classification of the tissues of the body is one of the most striking features of modern anatomy, and involves points in connexion with the primitive or simple structures, and their compound modifications, of the utmost utility, not only in reference to physiology, but, also, to pathology. Illustrations of its application, in both cases, are numerous, for it is impossible that physiology and pathology can be cultivated with advantage, unless their principles are founded upon this basis.

The different parts of the human body, however dissimilar in their physical appearance, consist of simple reticular tissue, or its modifications; or of a combination of one or more of them, with the muscular and nervous primitive organic structures; a fact that cannot be doubted, unless exceptions exist in some of the *unorganized* tissues. But it is obvious to our senses, that organs, and parts, differ from each other in their anatomical character, and, therefore, it is not enough for scientific purposes, to confine ourselves to the bare truth, that reticular, muscular, and nervous, or reticular and nervous fibres, enter into the composition of this or that structure. Our knowledge of tissues must be more definitive; and to render it so, it is imperative that we should study

those modifications and combinations, by which they acquire their specific qualities, and which, even the uninitiated would not hesitate to call distinct varieties of texture. These observations are intended to show the importance of classification, as applied to the tissues of the body; and to Bichat is due the honour of having first given method to the study of this useful branch of knowledge, however much or little he may have availed himself of the ideas of his predecessors, as to the real nature of the tissues themselves. It cannot be necessary that I should give an account of Bichat's arrangement, or of the classifications of other writers, which, for the most part, so nearly resemble that of the French anatomist; but I shall presume to offer you an arrangement of my own, founded, principally, on the situation which each part occupies in the scale of vitality, as from its comprehending *all* the tissues, (a point not perfectly gained in any other classification,) it appears to me to be entitled to preference.

ANATOMICO-PHYSIOLOGICAL CLASSIFICATION OF THE TEXTURES OF THE HUMAN BODY.

GENERAL ANATOMY.

DIVISION I.—INORGANIZED TEXTURES.

E. G. Cuticle—Hair—Nails—Enamel of the Teeth.

DIVISION II.—DUBIOUS TEXTURES.

E. G. Rete Mucosum—Crystalline Lens.

DIVISION III.—ORGANIZED TEXTURES.

CLASS I.—FIRST ELEMENTARY, OR RETICULAR TEXTURE.

ORDER I.—SIMPLE MODIFICATIONS OF RETICULAR TEXTURE.

Genus I.—Reticulo-elastic Textures.

Species 1.—Simple reticulo-laminated, ...	*e. g.* fascia superficialis, &c.
Species 2.—Compound reticulo-laminated,	*e. g.* lig. nuchæ. lig. subflava, &c.

Genus II.—Reticulo-inelastic Textures.

Species 1.—Compact and opaque reticulo-laminated, ...	*e. g.* periosteum, perichondrium, ligament, fibrous sheaths of tendons, enveloping fasciæ of the muscles of the extremities; temporal aponeuroses, enveloping membranes of certain organs, as dura mater, tunica sclerotica, tunica propria of the kidney, tunica albuginea, tunica propria ovarii, tunica propria of the spleen, sheaths of the corpora penis.
Species 2.—Compact and opaque reticulo-tendinous, ...	*e. g.* tendons and aponeuroses of muscles.
Species 3.—Compact and transparent reticulo-laminated, ...	*e. g.* cornea.

Genus III.—Reticulo-elastic Solid Texture or Cartilage.

Species	1.—Reticulo-laminated cartilaginous textures, ...	*e. g.* cartilages of the nose, ears, trachea, larynx, eyelids.
	2.———— interarticular cartilaginous textures, ...	*e. g.* maxillary-interclavicular-cartilages of the ribs, semilunar, &c.
	3.———— articular-cartilaginous textures, ...	*e. g.* those tipping the bones.

Genus IV.—Reticulo-inelastic Solid Texture or Bone.

Species
1.—Long bones.
2.—Short bones.
3.—Flat bones.
4.—Teeth.

CLASS I. CONTINUED.

ORDER II.—COMPOUND MODIFICATIONS OF RETICULAR TEXTURE.

Genus I.—Reticulo-secreting Textures.

Species
- 1.—Reticulo-cellular secreting textures, ... — *e. g.* adipose and medullary structures.
- 2.—Reticulo-membranous secreting textures, ... — *e. g.* the different glandular organs.
- 3.—Reticulo-parenchymatous secreting textures, ... — *e. g.* secreting membranes of the eye and ear, serous membranes, synovial membranes, cutaneous and mucous membranes.

Genus II.—Reticulo-non-secreting Textures.

Species 1.—Reticulo-parenchymatous non-secreting textures, ... — *e. g.* lungs, spleen, &c.

CLASS II.—SECOND ELEMENTARY, OR MUSCULAR TEXTURE.

ORDER I.—VOLUNTARY MUSCLES.

E. G.—Muscles of loco-motion, voice, and the other voluntary muscles.

ORDER II.—MIXED MUSCLES.

E. G.—Muscles of Respiration, &c.

ORDER III.—INVOLUNTARY MUSCLES.

E. G.—Heart.

MODIFICATIONS OF INVOLUNTARY MUSCULAR TEXTURES.

Genus I.—Musculo-vascular Textures.

Species
- 1.—Arterial texture, ...
- 2.—Venous texture, ...
- 3.—Arterio-venous texture, ...
- 4.—Absorbent textures, &c. .....
  - Varieties,
    - 1.—Lacteals,
    - 2.—Lymphatics.
- 5.—Excretory ducts of glands....

— *e. g.* capillaries, cellulo-vascular or erectile texture, as that of the penis, clitoris, the different papillæ, puncta lachrymalia, &c.

Genus II.—Musculo-alimentary Textures.

Species
- 1.—Pharynx,
- 2.—Œsophagus,
- 3.—Stomach,
- 4.—Intestines.

Genus III.—Musculo-vesical Textures.

Species
- 1.—Gall bladder,
- 2.—Urinary bladder,
- 3.—Seminal vesicles.

Genus IV.—Musculo-genital Textures.

Species
- 1.—Of the male organs, ...
- 2.—Of the female organs, ...

— *e. g.* uterus, fallopian tubes, &c.

Genus V.—Musculo-ocular Texture.

Species 1.—Iris.

CLASS III.—THIRD ELEMENTARY, OR NERVO-CEREBRAL TEXTURES.	ORDER I.—NERVO-GANGLIONIC TEXTURE.	
	ORDER II.—NERVO-NEURIC TEXTURE, ...	*e. g.* nerves of organic life, nerves of animal life.
	ORDER III.—NERVO-SPINO-MEDULLARY TEXTURE.	
	ORDER IV.—NERVO-MEDULLO-ENCEPHALIC TEXTURE.	*e. g.* medulla oblongata, cerebellum and cerebrum.

1. INORGANIZED TEXTURES.—It will be seen in the foregoing classification, that I consider some of the animal structures to be devoid of life, but I am aware that some physiologists believe that there is no texture in the living subject, which is entirely destitute of the vital principle. It is true, the structures connected in the first division of the table, hold a connexion with the body by means of highly vascular textures; but I am of opinion that they, in themselves, are not endowed with life. No new anatomical facts have been elicited of late years, with respect to *hair, nails,* and *enamel*; but there still remain a few disputed points with respect to the *scarf skin,* amongst which may be mentioned its extent, and whether the epithelium of the mucous membranes is to be regarded as a continuation of the cuticle; Haller was in favour of this opinion, and believed that the cuticle covers all those parts of the body which are exposed to the contact of air and of foreign bodies; but this subject shall be again alluded to when we speak of mucous membranes.

2. Dubious Textures comprehend the *rete mucosum* and *crystalline lens;* I call them dubious, because their vitality, and even the existence of the former in the European, are disputed questions by some anatomists; but as the crystalline lens must be subservient to the laws of absorption and deposition, there is reason to suppose that it is a living structure, notwithstanding it is loose and floating in its capsule, and, therefore, completely insulated from all vascular connexions with the other tissues of the eye. How, then, does it live? is a question which the present state of physiological knowledge will not enable us positively to answer. Walther conjectures that it is nourished by imbibition, and that it absorbs its nutriment from the liquor morgagni, into which it again deposits its waste; if this be true, the lens is similarly situated to those animals in which there is no regular circulation, but merely absorbent and exhalent vessels, having no common centre. I have, however, *for the present*, placed the crystalline lens in the dubious division of tissues, as its real nature is still a controverted point amongst anatomists and physiologists.

3. Organized Textures.—Almost all anatomists of the present day, acknowledge the existence of three primitive tissues, or elementary fibres; namely, the cellular or reticular; the muscular; and the nervous. It is possible that the reticular texture, under certain peculiar modifications, enters into the composition of some of the inorganized and dubious structures; but as it is familiar to us in the regularly organized tissues only, I shall consider it apart from those textures. The

FIRST ELEMENTARY OF CELLULAR TEXTURE, and which I have called RETICULAR, because it is only rendered cellular by morbid or accidental circumstances, is more abundant, and of much greater extent, than either of the other primitive tissues, since, in its simple and modified conditions, it is distributed over the entire subject, forming the grand connecting medium of parts, and composing a large proportion of the principal organs of the body. The term "filamentous tissue," employed by Dr. Craigie, is strictly in unison with its physical character, for it may be described in the words of this excellent anatomist, as consisting of very minute filaments or thready lines, which follow no uniform or invariable direction, but which, when gently raised by the forceps, present the appearance of a confused and irregular net-work. These thready lines are seen to cross each other, and to form spaces, but not cells, as the name "cellular tissue" implies. It is true, as popularly known, that, by inflation, the fibres may be so pressed together, as to be made to form cavities, and the same thing happens in anasarcous swellings; but the change so induced, results, in the former case, from an artificial, and in the latter, from a morbid cause, and, therefore, ought not to be received as evidence of its natural condition. The uses of this universally diffused organic element are various. In its simple state it possesses a high degree of elasticity and extensibility, but, when *very* compact, it loses, for the most part, both these properties, which is proved, by inspecting and examining those modifications of it, which I have named "inelastic laminated textures." As its structure, in its

simple, and, in many of its modified forms, is not plentifully supplied with blood vessels and nerves, it, and its simple modifications, occupy a low grade in the scale of vitality.

The reticular texture presents many SIMPLE MODIFICATIONS in the body, some of which are laminated, some solid, some elastic, and some inelastic; thus they differ from each other in form, consistence, and properties. The first species of the *reticulo elastic textures* assumes a membranous or laminated form, and, as a general subcutaneous tissue, is well known by the name of fascia superficialis. Allied to which in property, but less simple, from containing, according to chemists, a good deal of fibrin in a peculiar state of combination, are the structures which we call ligamentum nuchæ and ligamenta subflava, which textures are found to possess a high degree of elasticity, but the other laminated modifications (see class *a*,) are totally inelastic.

The textures belonging to the *reticulo inelastic membranous* are classed, by almost all writers, amongst the "fibrous" tissues; but as the term "fibrous" may, with equal propriety, be applied to muscular and nervous structures, I have chosen to depart from this arrangement, and to class them in a genus which I have named according to the property of the included textures, and which I have divided into species, according to their anatomical form and character. Like the simple and compound reticulo-laminated tissues, the species of the inelastic membranous comprehend structures which are neither very vascular nor very sensible, and, therefore, they possess only, in a sparing degree, the vital principle.

With respect to the transparent cornea, a structure which is omitted in the classification of many authors, Professor Mayer places it with those tissues which he calls "Lamellar," in which order he includes the lens, cuticle, hair, nails, and, even, the teeth; but the cornea is more strictly laminated than either of the textures referred to, as it is separable into superimposed layers to the number of five or six, which are united together by means of a delicate cellular or reticular texture; and Edwards states, that the laminæ contain between them a limpid fluid, to which, in part, the membrane owes its transparency. The cornea is more vascular and sensible than the other inelastic membranous textures, and therefore endowed with a greater share of vitality than the reticulo-laminated tissues in general.

The remaining simple modifications of the reticular texture are *cartilage* and *bone*; but as some of those of the former are laminated, and as all of them are not subservient to the same uses in the animal economy, it is necessary to make a distinction, by dividing them into species; they all, however, agree in possessing the property of high elasticity, in which respect they differ from osseous texture, which is inelastic, and which, therefore, I have placed in another genus.

I do not think it necessary to dwell much on cartilaginous and osseous structures; but it may be right to remark with respect to bone, that all modern anatomists agree in believing that it is a reticulo-fibrous structure; therefore I feel justified in classing it with the first of the primitive tissues. To Scarpa, Hatchett, Howship, and others, we are much indebted

for very valuable contributions to our knowledge of osseous tissue, but in a more especial manner to Mr. Howship. His papers, which are published in the 6th and 7th volumes of the Medico-Chirurgical Transactions, are exceedingly interesting, and replete with useful information on this, once obscure, branch of anatomical knowledge.

The reticular primitive, or elementary texture, presents modifications of a more complex, and more highly vitalized character than the preceding; on referring, therefore, to the classification, it will be seen that, after the simple, I have spoken of the COMPOUND MODIFICATIONS of this class of textures; and as some of them are secreting, and others non-secreting, I have been induced to divide the order into two genera. The first genus comprehends the *secreting structures*, which are divisible into cellular, membranous, and parenchymatous.

In the first species of this genus I have placed the *adipose and medullary textures*, as they may be considered in every respect as structurally analogous. Nothing new is known concerning them, beyond the confirmation of the fact, that Dr. Hunter was right in his opinion that their cells are distinct, each vesicle having no communication whatever with its neighbouring vesicles.

The second species of secreting textures are membranous, and include the *membranes of the eye, the ear, the serous membranes of the cavities, the synovial membranes, and the dermoid and mucous membranes.*

The *secreting membranes of the eye and ear,* are, the membrane which secretes the aqueous humour;

the hyaloid membrane; the capsule of the lens; the choroid coat; and the membrane of the labyrinth of the ear. All the fluids secreted by these textures, are recrementitial, and, probably, endowed with an obscure degree of vitality.

The membranes of what are commonly called cavities, are the *serous* and *synovial*, which, according to the opinion of some anatomists, ought to be classed together; but Bichat has separated the serous, from the synovial tissues. Dr. Monro, in his work on the Bursæ Mucosæ, first pointed out the resemblance betwixt these two membranes; and the late Dr. Gordon, Meckel, Cloquet, and some modern writers, have expressed themselves to the same effect; but their identity is altogether denied by many anatomists. The serous and synovial membranes agree in one respect, namely, in their sacciform arrangement. It is well known that the pleura, pericardium, peritoneum (excepting in the female subject, where a communication is found to exist between the mucous and serous membranes by means of an aperture at the extremity of each fallopian tube), tunicæ vaginales, and tunica arachnoides, are shut sacs; and it is the same as it respects the synovial capsules of joints, and the bursæ; but the fluid secreted by the serous, differs from that of the synovial membranes, in being less viscid, and in possessing ingredients which are not present in the synovial secretion. But, this is not enough to destroy all identity, since mucus, although formed under all circumstances by a similar organic structure, presents different chemical results, according to the situation from whence it has been obtained.

The membranous secreting textures which come next in order in complexity of organization, are the *dermoid* and *mucous*, which tissues are now considered as one and the same, so far as their origin and structural character are concerned. Bonn, in his work entitled "De Constitutionibus Membranarum," published in 1769, has mentioned their mutual approximation, and reciprocal transition into each other; and represents the mucous membranes as an interior production of the true skin, and as lining the internal, as the cutis vera covers the external, parts of the body. This fact is now, I believe, generally admitted, and fully confirmed by the observations of Meckel, and others, who have watched the development of the intestinal canal during the early months of fœtal existence. At this period, the gastro-enteric mucous membrane, which is previously formed by the vitellar membrane of the ovum; and the allantois, or vesical membrane, which afterwards forms the genito-urinary mucous surface, are in direct communication at the mesial line, and, afterwards, at the navel, with the skin, or external integument. I am of opinion then, that this point in anatomy is fully settled; but, in allowing the anatomical nature of the two tissues to be the same, we yet must admit that there are certain modifications in their *vital* properties; which admission renders it necessary to examine the dermoid and mucous textures under two separate heads.

Many volumes and papers have been written on the *cutis vera*, but much confusion prevails in the works of some authors, from their multiplication of the parts connected with it: great difference of

opinion too has existed respecting the true nature of skin. Chevalier regards it as a muscular structure; and some anatomists consider it as ligamentous; but there seems to be no just reason for supposing either of these opinions to be the true one. Its chemical composition is involved in obscurity, but, like the other reticular textures, it is found to contain gelatin, mixed up with other materials that cannot be analyzed.

If we examine the mucous membranes at the adult age of life, we shall find them to consist of two portions, namely, an upper and lower. The upper commences at the mouth and nostrils, and, after lining the oral cavity and ducts of the parotid and other salivary glands, and, by its nasal portion, all the cavities communicating with the nostrils, and extending, by the ductus ad nasum, to the surface of each eye, it passes to the fauces, where it sends off a process, by the eustachian tube, to the interior of each ear; afterwards it is continued, by one division, to the ultimate terminations of the bronchial tubes in the air cells; while, by a second, it gives a lining to the œsophagus, stomach, intestines, and the excretory ducts of the liver and pancreas. The inferior portion consists of the urinary and genital divisions. But although all these divisions are justifiable when the process of organization is completed, still it must be remembered, that observation on their development does not countenance the distinctions maintained, as the different processes form, at their origin, one continued tissue, and that in union too with the true skin. A good idea of the inflections of the mucous membranes

may, like those of the serous, be well conveyed to the mind by means of diagrams.*

In comparing the similarities which anatomists have endeavoured to establish, between the cutis vera and mucous lining of the different passages, it cannot be unimportant to investigate every supposed ground of analogy, and therefore it is natural to inquire, whether the mucous membranes are covered with a cuticle like that of the external skin. Most anatomists are of opinion that the epidermis becomes insensibly lost in the mucous membranes, and that it is not continued much beyond the external apertures. Haller, however, thought otherwise, and has given it as his belief, that it follows them throughout their whole extent, but that in the interior it becomes a modified tissue. The cuticle, we know, is, from time to time, cast off in the form of branny scales; and Raspail is of opinion that a similar "decortication" takes place, not only from the exterior of the body, but also from the surfaces of the internal passages; thus, he observes, the saliva, if examined before breakfast in the morning, offers to the microscope the debris of the buccal surfaces; and these debris, he remarks, are evidently like the scales of the epidermis. All the mucous membranes, he thinks, throw off daily similar layers, which may be seen in the excrementitial discharges; and in which, even traces of vascular organization, he says, are sometimes visible. The existence, however, of an internal cuticle, ought not positively to be in-

* The Author exhibited to the meeting some original plans illustrative of the subject; also some highly-finished oil paintings, beautifully executed, by Mr. J. Smith, Surgeon, of Manchester.

ferred from Raspail's observations, as the laminæ which he speaks of, may be, and probably are, nothing more than inspissated mucus. Bichat, and other anatomists, admit that, although the scarf skin can be demonstrated at the dermo-mucous junctions, it cannot be shewn, in a satisfactory manner, to exist in the stomach, intestines, bladder, and other organs; and with respect to its extent in the gastro-enteric division of the mucous membrane, Beclard states that it can be traced down the œsophagus to a point a little beyond the cardiac extremity of the stomach, where he, with most other anatomists, believes it finally terminates.

Much additional information, on the subject of the mucous membranes, may be gleaned from consulting the works of Haller, Nicholls, Bichat, Cloquet, Beclard, Ribes, Craigie, and Grainger.—Ribes has recorded some highly interesting facts on the structure of the villi of the intestinal portion of these membranes; and valuable references to the pathological importance of the study of the mucous membranes, will be found in the excellent volume of Dr. Craigie, where it is remarked that morbid states of this membrane constitute a large proportion of the diseases which daily come under the observation of the physician; a truth which will serve as an apology for my having given so lengthened a detail of this texture.

The third kind of secreting textures comprehends the RETICULO-PARENCHYMATOUS, or those organs which secrete fluids of a more compound nature than those formed by the preceding tissues. I include in this species, 1st, the glandular organs

connected with digestion, as the *salivary glands, pancreas,* and *liver;* 2ndly, the *lachrymal glands;* 3dly, the *kidneys;* 4thly, the *testes;* 5thly, the *ovaria;* 6thly, the *mammæ;* and the *tonsil, thyroid,* and *thymus glands,* may also be classed amongst them. There can be no misunderstanding as to the propriety of including all these organs in the same species, unless as it regards the ovaria; yet, as it is to be presumed that the primordia of new beings are secreted by these bodies, I feel justified in placing them amongst the glandular organs; and am supported in so doing, by Meckel and Beclard.

There are no subjects more open to further research, than the anatomy and physiology of the parenchymatous-secreting textures; notwithstanding some valuable additions to our knowledge have been made by the minute investigations of the structure of the testes, and thymus gland, by Sir A. Cooper; and of the liver, by Mr. Kiernan. The works of the former distinguished anatomist have, doubtless, been read by most persons in the profession, therefore no comment on their merit can be necessary; but it is possible, that the valuable paper on the anatomy and physiology of the liver, by Mr. Kiernan, published in the Philosophical Transactions, has not met the eyes of all medical readers, and therefore a few remarks upon it will, I hope, be well received; the discoveries of this ingenious and skilful anatomist being replete with interest. The minute structure of the lobules; their arrangement; their connexions with each other, and with vessels, are the subjects to which Mr. Kiernan has directed his particular attention; and

he seems to have arrived at very faithful and just conclusions concerning them. This author does not presume to claim the merit of having first shown the existence of lobules in the hepatic tissue, but, on the contrary, admits that Malpighi discovered them, and was led, in consequence, to place the liver amongst the conglomerate glands; but Malpighi was unacquainted with the form of the lobules, with their peculiar arrangement around the hepatic veins, and with the manner in which the vessels are distributed in them.

The researches of Mr. Kiernan have led him to conclude, that each lobule is composed of a venous plexus formed by branches of the portal vein: of minute arteries derived from the hepatic: of a plexus of biliary ducts, and of the primary branches of the hepatic veins. That the hepatic veins, with the lobules, present a tolerably accurate resemblance to the trunk, branches, and leaves, of a tree. The lobules may be compared to the leaves; the substance of the lobules, arranged around the minute branches of the veins, may be resembled to the disposition of the parenchyma of a leaf around its fibres; the vessels in which the veins terminate may be compared to the branches of the tree; and these vessels, by their junction, form the trunks. He divides the hepatic veins into two classes, namely: those veins contained in the lobules; and those contained in canals formed by the lobules. The first class is composed of the intra-lobular branches; one of which occupies the centre of each lobule, and receives the blood from a plexus formed in the lobule by the portal vein. The second class

of hepatic veins, is composed of all those vessels contained in canals formed by the lobules; in which class numerous small branches, as well as the large trunks which terminate in the inferior cava, are included. They all resemble each other, in being contained in canals; and differ from the vessels of the first class, which are contained in the lobules. Further divisions of these veins are mentioned by the author, but I need only remark, that every branch of the hepatic veins belongs to one of these two classes of vessels. Mr. Kiernan has given a minute description of the arrangement of these vessels; and states, that each intra-lobular vein is composed of a central vessel, and of from four to six or eight smaller branches which terminate in it. And he has further proved, by observation, that the intra-lobular veins invariably correspond in form with the lobules, the substance of which is arranged around them; and as these vessels resemble, in some degree, the fibres of a leaf, so secretions from the lobules, made in the direction of the vessels, assume a more or less foliated appearance. It is impossible to convey, in words, a just idea of the beautiful discoveries of Mr. Kiernan, I must therefore content myself with the hope, that these few observations will be the means of directing the attention of the profession to the paper itself, which is illustrated by a series of delicately executed engravings. At the conclusion of his essay, Mr. Kiernan draws some physiological deductions from the anatomical facts which he has detected. He believes that the bile is secreted from venous, and not from arterial, blood: that the blood which enters the liver by the hepatic

artery, fulfils three functions—it nourishes the organ; supplies the excreting ducts with mucus; and, having performed these purposes, it becomes venous, enters the branches of the portal veins, and not the radicles of the hepatic, as generally supposed, and contributes to the secretion of bile: thus the vasa vasorum of the liver are branches of the hepatic artery and portal vein. The portal vein fulfils two functions: it conveys the blood from the artery, and the mixed blood to the coats of the excreting ducts. This vessel has been called the *vena arteriosa,* because it ramifies like an artery, and conveys blood for secreting; but it is an arterial vein in another sense, as it is a vein to the hepatic artery, and an artery to the hepatic vein. Lastly, the function of the hepatic veins is to return the blood from the lobular venous plexuses, into the vena cava inferior. It might be conjectured by many, that the cases in which the hepatic portal vein was found wanting, would militate against Mr. Kiernan's opinion, that bile is formed from venous blood; but he answers this objection by remarking, that in these cases the hepatic artery was of unusual size; and, from the manner in which its branches terminate in the veins of the coats of the vessels, venous blood was even then the source from whence the biliary secretion was derived.

There yet remains a doubtful point in connexion with the structures of all secreting organs, from the cellular, to the complex and ductiform gland: I mean, the direct anatomical route by which the secreted fluid escapes from the secreting capillaries. Haller, and others, believe that the ultimate ramifi-

cations of the arteries terminate in two ways, namely, in the commencing veins, and in the radicles of the excretory duct: but some excellent anatomists doubt the truth of this opinion. Richerand asserts, that the capillaries possess lateral or organic pores, through which the various fluids required for nutrition, as well as secretion, are separated from the blood; and Magendie has attempted to revive the old opinion, that exhalation depends on transudation. In reference to these different statements we may remark, that the exhalent orifices of Haller, and the latent pores of Richerand have never been seen, and therefore their existence is founded on conjecture only; and although proofs are not wanting to confirm the fact, that poisonous substances can exert their deleterious operation on the body through the medium of the coats of the vessels, yet we need additional evidence to that which we already possess, to confirm Magendie's theory, that it is by any process like that of transudation that the compound fluids pass from the secreting vessels to the parts destined to receive them.

Much that is interesting might be added to this sketch of the glandular tissues, but we have to regret that the vito-chemical process of secretion is still involved in considerable obscurity, notwithstanding the anatomy of the organs concerned in this function is tolerably well understood. That the nervous system is implicated in secretion there is little doubt, but whether it be more so in this than in any other compound animal process, is a question not easily answered. The late Dr. Haighton, Dr. Wilson Philip, Sir B. Brodie, and others, have shewn that

the division of the nerves belonging to a secreting organ, has the effect of putting a stop to its function; but we also know, that secretions are suspended, diminished, and otherwise changed in degree and character, by inflammatory action, and by other causes that cannot always be referred to the influence of nervous energy. It must be conceded, that the function of secretion is a species of chemical operation totally unknown to us, and is not to be explained by electricity, or any other agent with which we are acquainted. The chemical affinities which govern elements in an inorganized body are always the same, as their combination is uniformly determined by the law of definite proportions; but the laws of affinities, which control the same elements in an organized structure, are so modified by the agency of life as to produce effects which chemistry alone is unable to unravel.

The RETICULO-PARENCHYMATOUS NON-SECRETING TEXTURES are the last of the modified forms of reticular tissue, and comprise the *spleen* and *lungs*. The first of these organs has been classed, by some authors, amongst the erectile, and by others, amongst the glandular structures. Its texture is evidently cellular, but there is no feasible reason assigned for its being either erectile in property, or glandular in function. No very important discovery has been recently added to our stock of knowledge with respect to the lungs. Professor Mayer, of Brun, has advanced an opinion in opposition to that of Haller, Meckel, and others, that the veins of the lungs do possess valves. He states, that a valve always exists at the place where a branch enters at an acute angle

into a venous trunk; and that the more acute the angle, the more evident the valve; and that when the branches enter at right angles, the valves are wanting: and this, indeed, is the case in other parts of the nervous system. Mayer's paper on this interesting fact was originally published in Tiedemann's Physiological Journal, and has appeared in many of our periodicals.

Class II.—Second elementary, or muscular texture.—Muscular texture ranks next in extent to the reticular fibre, and is to be distinguished from all other structures by possessing the vital property of contracting itself on the application of a specific chemical, or mechanical, stimulus. But since Bichat published his peculiar opinions on animal and organic contractility, the minds of anatomists have become unsettled on the elementary nature of muscular fibre; and some physiologists have denied the test which, at one time, was supposed to be the infallible proof of its existence as a component part of an organ.

There is no texture of the human body to which more patient investigation and research have been devoted, by physiologists and chemists, than to that of muscle; but we cannot boast of having made any great advancement either in the discovery of its true nature, or of the causes of its functional phenomena. Its molecular character, and the arrangement of its globules, have been the boasted theme of animal chemists and microscopic observers; but great discrepancies and extravagant contradictions have alike resulted from this mode of research, in connexion with muscular, as well as with reticular,

texture. The evidence of our unassisted senses teaches us that the texture of a muscle is fibrous; that its body is composed of fasciculi; that the fibres which form each fasciculus, or bundle, can be reduced to filaments; and that the filaments may be divided and subdivided to considerable minuteness. A lens informs us, that what appears to the naked eye as an ultimate filament, is composed of many threads; and physiologists, who are wedded to the molecular theory, believe that we do not reach their definite division until we can reduce the appearance to a single row of globules, like a string of pearls. The late Sir E. Home, and Mr. Bauer, examined muscular texture by the aid of high magnifying powers, and have given it as their opinion, that the ultimate fibre is globular, and that each globule is equal in size to a globule of blood *when deprived* of its colouring matter, which makes a difference (according to Bauer's calculation) of the 300dth part of an inch; the magnitude of a globule, *with* the colouring matter, being about 1-2000, and *without*, about 1-1700 of an inch.

This opinion, however, has been objected to by Dr. Hodgkin, Mr. Lester, Mr. Cooper, Sir A. Carlisle, Mr. Grainger, and others. Dr. Hodgkin, instead of molecules, found an immense number of transverse lines crossing the longitudinal fibres; and as he could not detect a similar appearance in any other texture, he considers it as the indication of the true physical character of muscular structure. Chemical analysis has proved that fibrine constitutes an essential constituent part of most muscles, and, therefore, the presence of this substance is considered

the best test of muscularity;—but may it not sometimes exist in a modified form, or in so peculiar a state of combination, as to defy detection by the ordinary modes of chemical examination?

However much at variance anatomists may be on the essential character of muscular tissue, all physiologists accord in the opinion that its vital property is contractility, a property dependent on the principle of irritability, the source of which is unknown. Each muscular part requires its natural stimulus in order to produce action. The stimulus to the voluntary muscles is the will; but the stimuli to the involuntary organs are various: the blood is the natural stimulus to the sanguiferous system; aliment to the stomach; bile to the intestines; chyle to the lacteals; lymph to the lymphatics; the different secreting fluids to their respective ducts and reservoirs; and light to the iris. If all these parts be endowed with the power of contraction, it is fair to presume that they are furnished with muscular fibre; for the proofs offered by some physiologists, are not sufficient to induce me to believe that any fact can manifest the property of active contractility, without such a provision. In accordance with this opinion, I have spoken, in my classification, of modified involuntary muscular textures, which I have arranged under the heads—musculo-vascular—musculo-alimentary—musculo-vesical—musculo-genital—and, musculo-ocular.

In the *musculo-vascular genus* I include the arteries, veins, those textures which are intermediate between arteries and veins, absorbents, and the excretory ducts of glands; to which structures much

time might profitably be devoted, but I shall be obliged to confine myself to a few general remarks on some of them.

The real nature of the middle tunic of arteries is still disputed, but some interesting facts, on the arrangement of its fibres, have been published. Although nothing particularly new has resulted from modern researches into the anatomy of the venous system, it cannot be denied that several attractive inquiries have been instituted by Drs. Carson, Barry, and others, upon this order of vessels, but they have been undertaken more especially with a view to determine the influence of their circulatory function. In connexion with the veins, I may moreover mention, that the theory of venous absorption has been revived; and it can no longer be doubted, that communications do exist between the veins and lymphatic vessels.

The capillary system has, of late years, been closely studied, but the diminutive size of the vessels composing it, is an insuperable obstacle to the demonstration of their anatomical structure; by experiments, and microscopical observation, we have, however, learnt many facts connected with their organic and vital properties. The term capillary system is employed by writers, to designate an order of vessels situated between the terminations of the ramusculi of arteries and the origins of the veins; and the vessels composing it do, in all probability, partake of the combined character of arteries and veins; but to consider them as forming a distinct system of veins is not anatomically correct, and, therefore, not to be justified on any other

ground, than that many phenomena, both natural and morbid, seem, in an especial manner, to depend on the functions of the capillary vessels.

I have, in my classification, placed the *erectile tissue* as a variety of arterio-venous structure. It is not necessary to specify the organs in which their texture is found, but merely to remark, that it consists in a particular cellular-like arrangement of the small sanguineous branches, and especially of the veins. Some additional importance has recently been attached to the study of the erectile tissue, in consequence of the published opinion of Dupuytren, that this texture is to be regarded as the type and model of a multitude of accidental tissues, to which original and acquired vices of organization may give rise, in almost every part of the body, producing tumours of various volumes, which participate, more or less, in the properties of the natural erectile fabric, differing chiefly in the comparative weakness of their fibrous sheath, and in the more scanty supply of nervous branches. It has, moreover, been made known, that like the natural tissues of the same character, these accidental formations undergo, at the same epochs, and by the influence of analogous causes, a strongly marked development, or alternate tension and relaxation, corresponding with the state of health, of strength, or of debility in the individual affected.

The *absorbent system* has, of late years, occupied the attention of anatomists and physiologists, in a very marked degree; and some new facts have been recorded as the results of their researches. One of the most interesting of them, is the discovery of

lymphatics in the human placenta and funis, by Fohmann, who states, that they are so numerous in the navel string, that the point of a needle cannot be inserted into it without wounding one or more of these vessels; and that, to fill them with mercury, nothing more is necessary than to pierce the sheath with a fine lancet, when they may be easily injected with it.

The same distinguished anatomist published, in 1821, a volume on the communications which exist between lymphatics and veins; in which he brought forward additional facts to prove that the opinion of some of the older writers, on this subject, was quite correct; and, therefore, that Haller, Cruickshank, and Hunter, were in error. An experiment made by Mr. Hunter, on a dog, produced, in the minds of some anatomists, a reversion of opinion, so that the profession was divided on the subject; but the recent investigations of Fohmann, Magendie, and others, have, in my opinion, indisputably confirmed the fact, that the lymphatics and veins do form frequent communications, and that the latter assist the former in the process of absorption, each having, however, to perform a specific share in this important function. It is not a part of my design, in this report, to dwell more on the physiology of structures than is absolutely necessary to illustrate organization and anatomical arrangement; but I may be allowed to mention, that Magendie has advanced the opinion that absorption may take place without the aid of lymphatics, and he has concluded, from experiments, that the ancient hypothesis of venous absorption, ought to be substituted for the commonly believed

absorbing power of the lymphatic vessels. We would not willingly doubt the accuracy of Hunter, or question the legitimacy of the conclusions which this great man drew from the experiments which he undertook, to prove the reverse of venous absorption; yet, justice obliges us to allow that the weight of evidence in favour of the absorbent function of the veins, is so powerful as strongly to bias us to this opinion.

The last of the musculo-vascular tissues are the *excretory ducts of glands.* It is probable that some surprise will be excited by my arranging these structures amongst the modifications of involuntary muscular fibre; but I feel justified in doing so, by a general examination of facts and arguments on the muscularity of tubes for the circulation of fluids; and I am supported in the opinion by Professor Monro, who published a pamphlet, in 1826, containing useful practical "observations on the spasm of the canals for the food, bile, and urine." Many authors deny the presence of muscular fibre even in the gall-bladder; but if this organ can adapt itself to its contents, and contract when mechanically irritated, as witnessed by Dr. Monro, surely there is reason to believe that the gall-bladder is endowed with muscularity; and I would extend my belief of the existence of muscular fibre to the excretory ducts of the liver, and to those of other glandular organs.

The name "musculo-vascular texture," which I have given to the textures included in the first genus, will inform the reader of my opinion, that the blood vessels, absorbents, and ducts of glands,

are furnished with muscular fibres, and that they are contractile tubes; but still I admit, that the facts adduced, by the most respectable authorities, in favour of the opposite opinion, are such as ought to deter us from arriving at a hasty conclusion, either one way or the other. The arguments brought forward by the anti-muscularists, are principally founded on anatomical appearances, and chemical analysis, but I do not think it difficult to refute *many* of them. Thus, it is said, in reference to arterial tissue, that the structure is close, whereas, muscular fibre is loose; to this we may return for answer, that the muscular fibres of the uterus are equally close and compact as those of blood vessels. And it is just as easy to refute the arguments which are founded on difference in colour; arrangement of molecules; or even the absence of fibrin; for Orfila has detected this substance in arteries, which discovery has removed the most formidable objection made to the muscular theory.

Numerous facts concur to show that there resides an inherent power of action in the vessels of the body. The anatomical proofs are not few, but the physiological, pathological, and therapeutic, are even more convincing. The mode of development of the vascular system; the power which the blood vessels possess, of carrying on the circulation in the absence of a heart, or when this organ is so ossified (the case recorded by the late Mr. A. Burns) as to be incapable of performing its office; the vacuity of the arteries after death; their irritability and manifest contractility, on the application of a chemical or mechanical stimulus; the phenomena of

blushing, and cutaneous suffusion after the death of the heart; periodical action and secretions; local action in irritation and inflammation; growth of tumours, and many other facts, might be adduced on the side of inherent power, and in proof of this power obeying the laws of muscular irritability. At all events, I am at a loss to find out any other active principle that would produce the like effects; for if we examine the opinions of Bichat, we shall find that his "*tonicité*," as it is applied to the power of the blood vessels, is nothing more or less than that property which resides in muscular fibre. When speaking of vital contractility of tissue, Bichat proposes to divide it into two kinds, sensible and insensible. The sensible organic contractility nearly answers, he says, to the irritability of authors; and the insensible organic contractility, he calls tonicity. Bichat adds, "these words would seem to suppose, in the properties which they indicate, a *difference in nature*, whilst this difference only exists in *appearance*;" from which admission, no other inference can be drawn, than that the principle which influences the one, alike influences the other; and that the contraction of the heart, and that of the blood vessels, result from the same cause, although the cause of the former is sensible, whereas, that of the latter is insensible or obscure; and on this ground, Bichat has chosen to distinguish the former principle by the term irritability, and the latter by that of *tonicité*; as though these were two distinct agents. Bichat, indeed, anticipates such a construction of his opinion, for he adds, "*we do not consider these effects as proceeding from different principles; the one is*

but the extreme of the other, for they are both connected by insensible gradations." He instances, indeed, the circulation, as giving a very good idea of this graduated enchainment of the two kinds of organic contractility. The sensible organic power of contraction presides (according to Bichat) over this function in the heart and large vessels; by degrees it becomes less apparent, in proportion as the diameter of the vascular system decreases; and, lastly, it is insensible in the capillary tubes, where tonicity alone is observed. It is clear, I think, from this exposition of Bichat's views, that his "*tonicité*," as it is applied to the organs of circulations, is nothing more or less than irritability; and implies nothing more or less, than that the vessels act under the influence of a stimulus, from the same cause which excites action in all other muscular structure.

Much more might be given on this interesting inquiry, which is still open to controversy; but I should encroach too much on the valuable time of the Association, if I were more prolix with respect to the other genera of textures which I have classed amongst the modifications of involuntary muscular fibre. I presume no opposition will be offered to my arrangement of them.

Class III.—Third elementary, or nervo-cerebral textures.—Where so many parts are mutually connected, and essential to the well doing of the whole, it is difficult to give the due share of importance to each of them; but we are in the habit of associating more interest with the nerves, than with the other structures of the body, and it is certain, that their offices possess the highest vital

attributes. Now whether it be correct, or not, that there are some elementary reticulo-textures, as the cartilages, periosteum, dura mater, ligaments, and other structures, which do not possess nerves; an opinion entertained by some anatomists, but from which I dissent; the same cannot obtain as it regards the muscles, since we have numerous proofs, founded on experimental physiology, and on pathology, that shew the influence of the nervous system on muscular functions.

I adopt the name nervo-cerebral texture, in lieu of that of nervous tissue, because I agree with Dr. Craigie in the propriety of restricting the term "nervous tissue," to the nerves, ganglia, and plexuses; as it cannot be demonstrated that the cerebral structure is similar in its organic nature to the nerves; but it is reasonable to conclude, and not difficult, perhaps, to prove, that the ganglia and plexuses, especially the latter, are merely modified forms of the nerves themselves.

The present century will hold a conspicuous place in the annals of medical science, for many important discoveries, and for the confirmation of some ancient conjectures on the nervous system. At all times the brain and nerves have had allotted to them a superior station amongst organized textures; but it was awarded more in consideration of their presumed physiological influence, than from any positive knowledge which the ancients possessed of the anatomical character and arrangement of their different parts. They could not fail to be struck with the importance of the brain and nerves, when they could prove the first to be the instrument of volition

and sensation, and the last to be the auxiliaries to these functions; but of late years the minutiæ of structure have been studied in reference to functions, and thus our knowledge is become more definite, and we have been able to remove some of the principal theories and notions which were mixed up with the physiology of the nervous system in by-gone days.

It is not an easy task to give to each author on this branch of anatomy, the share of praise to which he may be entitled; nor, indeed, is it easy to trace all discoveries to their source; for the various contributions to our stock of information on this interesting subject, lie scattered in many volumes; but the principal facts worth preserving will be found recorded in the works of Willis, Lewenhoek, Vicq-D'Azyr, Monro, Prochaska, Reil, Soemmering, and Bichat; and the brilliant discoveries of these distinguished individuals have been increased by the labours of Rolando, Scarpa, Gordon, Walter, the Wenzels, Gall, Spurzheim, Cuvier, Home, Serres, Tiedemann, De Blainville, Bellingeri, Bell, Mayo, Magendie, Flourens, Fodera, Ollivier, and numerous other writers. My object, then, will be to record the most important facts which may be considered as confirmed by the best of these authorities.

It is proved, that no system of parts observes more regularity, in its progressive development in the different orders of animals, than the nervous system; and if time allowed, we should find it both useful and interesting to trace the gradations, as it would shew that each step, from simple to compound, is

accompanied by a corresponding increase in function; which circumstance establishes the fact, that an exact knowledge of the organization, arrangement, and distribution of structure, cannot precede every attempt to investigate the uses of the different portions of the nervous system. In some of the inferior animals, we find the rudiments of, and in others a perfect, ganglionic system. In ascending the scale, we arrive at the vertebrata, where we discover a spinal marrow and a brain; but the latter organ, in fishes and reptiles, is scarcely more than one remove from a collection of ganglia. In birds, the brain presents a more distinct cerebrum and cerebellum; which organs, however, are still more conspicuous and perfect in animals of the mammalia class: so that we find nothing here to arrest our attention, as very different from the human subject, except the marked development of the hemispheres of the cerebrum in the latter; thus pointing out the seat of that superiority which is the distinguishing characteristic of man. It is not, then, in the animal part of the nervous system, that we seek distinction from quadrupeds: it is, therefore, not in those portions of the brain which are subservient to mere animal purposes, that we find differences in organization. Animals are equal, indeed, in many respects superior, to ourselves in the organs and functions of the senses; but it is in intellectual energy, and in all the superior attributes of mind, that man is exalted above animals. This state of perfection, however, is, even in him, attained only by degrees; for it has been satisfactorily demonstrated, that the parts of the human brain, and the

rest of the nervous system, are gradually and successively evolved, and that the steps in the progress of development correspond with permanent states in the scale of inferior animals.

Anatomists do not agree on the exact order in which the parts of the nervous system make their appearance; but it is believed that the system of the great sympathetic nerve is formed before the spinal marrow; and the spinal marrow before the brain. The best authorities on this subject, are Serres and Tiedemann. Serres believes, with respect to the brain and spinal marrow, that they originally consist of two lateral halves, which, at first, are separated from each other, but afterwards become united at the mesial line: thus, according to this anatomist, the development of the cerebral system takes place from the centre towards the circumference. But Tiedemann differs from Serres in opinion, and believes that the progress of development is from the circumference towards the centre. The former conjecture is founded on the supposed fact, that the blood vessels influence the formation of the nervous mass, and that the organization of its different portions obeys the law of vascular development. Serres thinks that the spinal cord is formed first, under the guidance of the intercostal arteries, which are sooner developed than the carotid and vertebral; that the cerebrum is formed next, under the secretive influence of the carotid branches; and that the cerebellum is perfected last by the power of the vertebral arteries. Mons. Serres also thinks, that the cerebrum is developed from before backwards, and the cerebellum from behind

forwards, in accordance with the direction of the branches of arteries, which are respectively concerned in the secretion of these organs.

Whatever disagreement there may be on this subject, it is matter of extreme interest to study the relations which exist amongst the different structures of the nervous masses when fully found; an inquiry, however, which has also given rise to much contrariety of opinion. The relative connexion of the two textures called cineritious and medullary, which are to be found throughout the whole nervous system, is a point not quite decided. On this subject, Drs. Gall and Spurzheim have given us some new ideas. These anatomists believe that the former is the matrix of the latter; and that the grey substance necessarily appears before the white fibres. Serres, however, denies this as a general law, and it is contradicted by some other anatomists; but it would seem that the difference of opinion may, in some measure, be reconciled, when we consider that there has been too much stress laid on colour, for certainly it is true, as Dr. Spurzheim admits, that as colour is dependent on the vascularity of the texture, in some animals it must be white, and not grey or reddish, and, therefore, its nature is better expressed by the term pulpiness, than by colour; but, even in man, Mons. Serres adopts the opinion of Tiedemann, that the white substance appears first in the spinal marrow; but he thinks that in the optic thalami and corpora striata, the grey matter is deposited before the white makes its appearance. Dr. Spurzheim, however, is positive in his belief, and has adduced evidence to show,

further, that in the brain, when fully formed, the cineritious matter is never an isolated unit, but always found in connexion with the white fibrous substance: occasionally, he says, it lies in masses of varying magnitude; in some situations it occurs in layers; and it runs along in slips, following all the nerves in their course.

The change which has taken place in the views of modern anatomists, as to the dependence of one part of the nervous system upon another, is such, that many have ceased to speak of the great sympathetic nerves as productions of the brain and spinal marrow; of the nerves as originating from the brain or spinal masses, or of the spinal marrow as being a process of the brain; as we have evidence to prove that the ganglionic system is, to a certain extent, a distinct system of nerves; that nerves may exist without a brain, or spinal marrow; and that a spinal marrow may be present, and yet the brain be absent. Children and animals have been born without brain; still the spinal marrow and nerves existed; and as the inferior animals have nerves and ganglia, without the other parts of a nervous system, the latter cannot essentially be the origin of the former. In our corrected notions upon these points, we say (when the brain, medulla spinalis, and nerves, are present) that they hold a *communication* with each other; and although all these parts are necessary to volition and sensation, in those animals which possess them, yet, in the invertebrata, these functions can be, and are, performed without either a brain or spinal marrow.

Minute examination shows that the nerves of the

body are composed of fibres; but, in some cases, a microscope is necessary to render their filaments visible. In addition to the medullary fibres, a small quantity of cineritious structure is supposed to enter into the composition of each nerve. Some nerves are made up of one set of fibres, destined for one function, whilst others have two sets, and perform two functions. The nerves of the senses of seeing, smell, and hearing, are in the first class; but all the nerves of the spinal marrow, from combining the functions of sensation and volition, and deriving a set of fibres from each of the lateral pillars of the medulla spinalis, are in the second class. It is believed that the essential matter of nerves, which is supposed to be a peculiar pulpy substance, is contained in canals formed by processes of the neurilema; but the nature of this tissue seems to be still imperfectly known, as different anatomists have advanced different opinions respecting it. Reil represents it as cellular membrane, having blood vessels and some lymphatics. Scarpa has described it as connected, in anatomical origin and character, with the dura mater. Bichat believed it to be analogous to the pia mater, and, indeed, derived from that membrane; and Gordon agreed with Bichat, so far as it regards the neurilema of the central nerves; but in other situations he considered it as a species of cellular membrane. Whatever the true anatomical nature of the neurilema may be, there can be no doubt of its being a very vascular texture, and subservient, probably, either directly or indirectly, to the secretion of the nervous matter, or of something thereunto added, and upon

the presence of which the functions of nerves depend. The only circumstance that can invalidate the belief that the neurilema is essential to the constitution of a nerve, either in its generation or formation, is the opinion entertained by some anatomists, that the auditory nerves are destitute of it, and, certainly, it must be allowed, that if it do exist in connexion with these nerves, its tenuity is such as to carry it beyond the scope of common observation.

Of late years much attention has been given to the best method of classifying the nerves, and to Sir Charles Bell we are indebted for valuable assistance in this important and highly useful branch of anatomical knowledge. To him we owe the scientific division of the nerves into simple and compound; the former class including the nerves with single, the latter those with double roots. Sir C. Bell has explained the uses of this arrangement, and has determined, satisfactorily, the functions of many of the nerves. Professor Mayo has proved, by experiments on animals, that the portio dura is a nerve of motion only, and not, as Sir C. Bell says, "for sensation and voluntary motion jointly;" and that the facial branches of the fifth pair are sentient nerves. Mr. Mayo makes some valuable observations on the ganglionic and ganglionless portions of the fifth pair; and considers that the branches of the first are nerves of sensation, and that the ganglionless part of the same nerve, assists the portio dura in the function of volition. The experiments of Mr. Broughton, have led this distinguished physiologist to conclude, that the fifth pair of nerves is

highly sensible, and bestows sensibility on all the parts to which its branches are distributed; and that the portio dura is devoid of sensibility, and, therefore, conveys none, and that it is entirely a nerve of motion. Mr. Broughton's experiments satisfactorily prove, at all events, that the nerves have separate vital properties. Mr. Mayo disapproves, too, of including the glosso-pharyngeal nerves amongst the "superadded respiratory nerves" of Sir C. Bell, for he found, on irritating one of these branches in an animal recently killed, that the muscular fibres about the pharynx acted, but not those of the tongue. This physiologist is also of opinion, that, besides other unknown functions, the pneumo-gastric is a nerve both of sensation and volition; and that the *nervus accessorius Willisii* partakes of two functions; thus the professor assigns uses to these nerves different from those given to them by Sir C. Bell.

With regard to the lingual nerve, it is, doubtless, a nerve of motion; and whether Sir C. Bell be right in classing the patheticus with the respiratory nerves, is questionable. It goes to the superior oblique muscle of the eye, in the substance of which it is distributed, and is probably a nerve of motion; but it may be a compound nerve, as Mr. Fearns, of Dublin, has discovered an anastomosis between the patheticus and the first division of the fifth pair, where these nerves are passing the cavernous sinus on their way to the orbit, and immediately before the fourth pair comes to be in contact with the ophthalmic nerve. This discovery, which was verified by Dr. Macartney, of Dublin, Mr. Lizars, of

Edinburgh, and others, will probably lessen the difficulty of assigning offices to the pathetici, without supposing them to be in any way connected with the respiratory function.

I might extend my remarks on the classification of the nerves; but, although unwilling to do so, I feel myself under the necessity of omitting many facts, which might be mentioned, to elucidate the superiority of a physiological over a mere numerical arrangement of the nerves of the body.

It will not be required of me to give a detailed anatomical descripton of those appendages to nerves which present themselves in the forms of ganglia and plexuses. It is the common opinion, that every ganglion consists of a collection of minute nervous fibres, and a pulpy greyish substance, connected together by delicate reticular tissue, the whole being covered by a neurilema-like sheath; and that a plexus is nothing more than a union of some of the filaments of nerves, which filaments again separate, having undergone some alteration or modification in their arrangement; thus the plexuses serve to change, in some way, the distinction of the nervous fibres, and thereby to impart two or more functions to an organ according to its wants; there being but little doubt of the truth of the opinion, that a compound nerve is composed of filaments having different offices to perform, and that each filament remains distinct from its nearest to its most distant extremity, whether it end in a muscle in the skin, or in any other organ. It is a more difficult task to find a use for the ganglia of nerves. Those of the great intercostal were considered, by

Winslow, as originating branches, and, consequently, he regarded them as so many little brains. Dr. Johnstone, of Worcester, (father of the distinguished President of this Association) was the first to conjecture that the use of the ganglia is to render the parts, which derive nerves from them, "uniformly involuntary;" and he founded this opinion on the presumed fact, that no nerve goes to the heart, or to any of the abdominal viscera, but through the medium of a succession of ganglions. He was thus led to conclude, that these bodies are obstacles and limits to the powers of volition in the nervous system; the checks by which its empire is bounded, and its caprices guarded against by our all-wise Creator.

Meckel and Scarpa suppose the functions of the ganglia to be purely mechanical, namely, to facilitate the distribution of the nerves, to effect an intimate mixture of them, and to favour their union and separation.

Bichat, in his work on life and death, has described the ganglia as the means of isolating, from the influence of the brain, the parts which receive their nerves from them: and Reil is of the same opinion. A new theory on their function has been given by Dr. W. Philip. He has endeavoured to prove, that the ganglia of the great sympathetic do not cut off the parts they supply with nerves, from all connexion with the brain, but that they constitute a secondary centre of nervous power, and as they receive the influence of every part of the brain and spinal marrow, they bestow on the thoracic and abdominal viscera, on the vessels, and all secreting surfaces, the combined influence of these organs.

It appears to me that the ganglionic system is *principally* the system of vegetative life, but from existing individually and alone in certain animals, it is quite clear, that it must have, in these cases other functions. It presides over the involuntary organs, but it must also supply the nerves of the voluntary organs in those motive and sentient beings which have no other nervous apparatus. We may admit that this system of nerves is subservient to organic life, or to those functions which are performed without consciousness, in the four great classes of animals, and that the ganglia are, probably, organs of increase or nervous secretion; but in the invertebrata; they must be endowed with the power of imparting motion, as well as sensation and visceral functions, otherwise such animals would not possess the locomotive faculty Although it must be allowed, that in the lower animals the organic functions usually predominate, yet it must also be conceded that the ganglia, supplying the vicera, must furnish, also, the nerves of sense and motion.

That the ganglia (not merely those of the great sympathetic system) in the vertebrata are subservient to involuntary actions, or functions, is, I think, a plausible opinion, and appears to be strikingly corroborated, or at least strengthened by one of the presumed functions of the otic ganglion recently discovered by Arnold. This body, which is situated near the cartilaginous part of the eustachian tube, and the origin of the tensor tympani, forms communications with the fifth and the ninth, by means of the tympanicus, and lastly, by means of the latter with the facial and auditory nerves; which anasto-

moses are of the utmost importance in a physiological point of view. Many nerves derive their origin from this ganglion, but the most important of them is one which ramifies in the tensor tympani muscle. In anatomical character, the ganglion oticum is analogous to the ophthalmic ganglion, and in office it bears the same relation to the membrana tympani, that this last ganglion does to the iris. To comprehend this, it is necessary to understand that it is believed that the membrane of the drum has a double function, namely, the propagation of sound, and that of being the means of protection, and a *moderator* to the nervous ramifications in the interior of the ear. In the former office the membrane vibrates from the fluctuation of the air, but in acting as a means of protection, the membrana tympani does not merely keep off the immediate effect of air and other injurious influences, but moderates the too powerful action of sound on the internal ear. The discovery of the ganglion oticum is an interesting point in modern anatomy, and Mr. Tyler, who has translated Arnold's paper from the German, is entitled to the best thanks of the profession.

There is still much difference of opinion as to whether the ganglionic system of the invertebrata ought to be compared to the great sympathetic nerves of vertebrated animals, or to the spinal chord itself; but its comparison with the former would seem to be more correct and reasonable, than with the latter; still it is not an easy matter to decide this point. In molluscous animals the nervous system consists of nerves surrounding the œsophagus, and an annular swelling which embraces it; and it is

conjectured, by Cuvier and Blumenbach, that these parts correspond to the spinal marrow of the vertebrata; but Reil, and some others, are of opinion that they represent the grand sympathetic system.

The term *spinal marrow* is, in the present day, limited to that part of the nervous system which extends from the foramen magnum to the first lumbar vertebra; continuous from its upper part is the medulla oblongata, and from its lower, passes off the lash of nerves called the cauda equina. The medulla spinalis is commonly said to be composed of four columns, from which filaments proceed to form the spinal compound nerves. Each of these nerves is composed of some fibres which arise from the dorsal, and others from the abdominal pillar; and as the entire dorsal mass is more considerable than the abdominal, the posterior roots are found larger that the anterior; and the former will also be observed to communicate with the intervertebral ganglia, and in that way to keep up a connexion with the nerves of the thorax and abdomen. The celebrated Bellingeri dissents from the common opinion with respect to the spinal chord; for, instead of four volumes, he has spoken of six whitish or medullary bundles or strands, which he names cerebral, restiform, and cerebellic; the first are continuous with the corpora pyramidalia, and, therefore, communicate almost directly with the brain; the second are continuous with the corpora restiformia; and the third are continuous with the cerebellum. If time permitted, it would be interesting to examine Bellingeri's theory of the uses of these different columns, and their nerves; and, also, to explain his

doctrine of the antagonism of the nerves. The views of Dr. Marshall Hall, on the "reflex function" of the nerves, and especially of the spinal marrow, would, likewise, merit attention, if my report were not principally confined to the investigation of anatomical points. In whatever way the effect may be brought about, it may be considered as an established fact, that the spinal chord is the nervous apparatus of the muscular and sensitive functions of the trunk, and the medium of communication between its nerves and nervous connexions, and the sensorium commune. All minor points and controversies I shall avoid in our present inquiry, as it is my desire to confine myself, as much as possible, to matters of fact; for without some limit of this kind, the report would be almost interminable.

The next part of the nervous system, which has engaged the attention of anatomists, of late years, is that mass which is bounded, above, by the pons varolii, and, below, by the foramen magnum, and named the *medulla oblongata*, which, with the cerebrum and cerebellum, compose, according to Flourens, those portions of the nervous system which exercise their functions spontaneously or primordially, and which originate and preside over the vital actions of the subordinate part. In the medulla oblongata are seen six bodies: the two corpora restiformia, two corpora pyramidalia, and two corpora olivaria. The first of these contain a pulpy substance, which is supposed to generate the primary medullary matter of the cerebellum; an inference deducible from the fact, that it is always found relatively to the volume of the entire cerebellum;

but besides these apparatuses of medullary fibre, various others are met with in each lobe of the lesser brain. The corpora pyramidalia and olivaria have, in their substance, some cineritious masses, which are supposed to form the primary roots or bundles of the cerebrum. Waving the consideration of the decussation of fibres in the pyramidal bodies, which is a fact so evident to the senses as not to admit of a moment's doubt, the next interesting modern discovery, is the course of the corpora pyramidalia, and corpora olivaria through the pores, and the additional bulk acquired in their transit through this and other apparatuses of increase, until they ultimately compose the crura cerebri. These crura, or fibrous bundles, are further augmented, in their passage to the hemispheres, by the addition of new fibres from the thalami nervorum opticorum and corpora striata, so that eventually they spread out, and form the convolutions of the brain. Tiedemann, in the 13th plate, illustrative of his "*Anatomie du Cerveau,*" has delineated the fibres to the peripheral extremities of the convolutions; but it is commonly admitted that they cannot be traced to the convolutions themselves; still, it is the opinion of Beclard and others, that their existence may be inferred, from the mass being more easily torn in one direction, than in another. It is impossible, at present, to pursue this interesting subject to the extent it merits, but, if time would allow, I should advert to a variety of other important topics connected with it, as, the structure of the convolutions; and the nature of the commissures, or media of communication of the opposite hemisphere of the brain, so satisfactorily

described, and ably demonstrated, by the late Dr. Spurzheim.

As, I presume, it was intended by the Council of the Association, that my report should be principally confined to facts illustrative of the present state of anatomical science, it will not be expected that I should dwell on the connexion which exists between nervous masses and nervous functions.

In a summary manner we may state, however, without fear of contradiction, that the nervous system aids the internal organs in the discharge of those functions which are accomplished without the influence of the will; and that different parts of it are subservient to sensation, volition, sympathy, and to the mental faculties; but our physiological researches have not, as yet, enabled us to determine, positively, what the *principle* of nervous action is. Of the theories broached respecting it, the opinion of its being identical with electricity, or galvanism, is most plausible, for there is certainly a closer analogy between nervous and electrical, than between nervous and any other class of phenomena. Mr. Earle, in his "New Exposition of the Functions of the Nervous System,"* has expressed a belief, that the essence of that system is similar, if not the same as that of electricity, and has even ingeniously attempted to demonstrate its circulation; but this

* In the volume of Transactions of the "British Association for the Advancement of Science," for 1833, there is published an interesting paper on the Physiology of the Nervous System, by my friend Dr. C. Henry, of Manchester; and much valuable information will also be found, on this important subject, in the Physiological Works of Dr. Bostock, Dr. Elliotson, Dr. Alison, and in Dr. Milligan's Translation of Magendie.

subject will, and must, for ever remain in obscurity. Nothing can tend more effectually to humble our pride, and to subvert the proud notion that the powers of human ingenuity are capable, if properly and industriously directed, of achieving a triumph over the numerous difficulties which the extensive field of physiology presents, than a calm and dispassionate consideration of our *real* knowledge of the functions of nervous masses; and this remark will apply, with double force, to the attempts of some physiologists to unravel the mysteries of mind, and to disclose the concealed and secret workings of the brain. To point out the seats of the faculties is, indeed, a difficult task; and much as I admire the candour, industry, indefatigable research, and philosophical acumen, possessed by the late Dr. Spurzheim, with whose acquaintance and friendship I was honoured, and whose loss to physiological science, no man more sincerely regrets than I do; yet I am convinced that phrenology has not, as yet, attained such a state of perfection, as infallibly to inform us of the seats of the knowing and reflecting faculties, the sentiments, and the propensities of our nature. At the same time, I believe, that the *principles* of the science are true; that the inquiry can lead neither to immorality, nor irreligion; and that its principles may be applied to practical purposes in morals, medicine, and education, without an implicit belief in all its dogmata. Although no phrenologist, that excellent man, the late Dr. Barclay, of Edinburgh, acknowledged himself indebted to Dr. Spurzheim, Sir G. Mackenzie, and Mr. Combe, for several new and important views which they had suggested,

and pledged himself, as every liberal man would do, never to subscribe to the sarcasm, "that what is true in the doctrines of phrenology is not new, and what is new in them is not true;" and Professor Kidd, alluding to its moral tendency, observes, "that the study of the science may be attended, sometimes, with the happiest consequences; for if, from the contemplation of it, we can be strengthened in our conviction of the fact (which both reason and revelation teach us) that each individual is liable to particular temptations, depending on his specific temperament, we shall thus have one additional memento of our frailty, and one additional incentive to watch over, and combat, 'the sin which doth so easily beset us.'"

Having now completed my views of textures, the next subjects, in natural order, to be considered, are the organs and apparatuses of the body; the tissues variously modified and combined, being the component parts of the former, and these arranged according to function, being those of the latter. The apparatuses may be divided, first, into those of external relation, or such as connect man with surrounding objects: secondly, into those of internal, or such as are necessary to his individual welfare and existence: and, thirdly, into those of reproduction.

THE SECOND DIVISION, OR SYSTEMIC ANATOMY, has had recently bestowed upon it more attention than it formerly had; thus, within the last few years, this department of medical literature has been enriched by so many valuable contributions, that the anatomical student, instead of being limited in his choice of works, to those of Fyfe, Bell, and Monro,

in this country, as he once was, is now placed in the difficult situation of not knowing how to select one work more deserving of his study and perusal than another.

The full analysis which I have given of the tissues of the parts which they compose, supersedes the necessity of any further comment, in this place, on the organs of the body; but I should be doing injustice to the numerous writers on descriptive anatomy, if I were not to mention the names of those who have especially devoted their labours to this division of anatomical science. Added to the systems of anatomy published on the continent, by Vicq. D'Azyr, Sebatier, Portal, Bichat, Boyer, Bonner, and Meckel, have been those of Bayle, reduced into English by the late Mr. Bennett, a most accomplished anatomist; of Beclard and Cloquet, ably translated by Dr. Knox; and a system of anatomy, now in course of publication, by Bourgery, seems a work of great promise. In the English school, the volumes of Fyfe, and Messrs. J. and C. Bell, have been followed by those of Professor Monro, in a new and improved edition, and by the excellent works of Mr. Lizars, Mr. B. Cooper, Dr. Quain, Mr. Tuson, and Mr. Paxton; and Mr. Cox, of Birmingham, has also published an useful synopsis. But although much in the way of valuable addition has thus been made, we have, in prospect, another work, to the appearance of which we look forward with much interest, namely, the "Cyclopædia of Anatomy and Physiology," announced under the auspices and superintendance of that distinquished human and comparative anatomist Dr.

Grant, who is to be assisted by many highly talented individuals. This work bids fair to be a valuable adjunct to the libraries of medical men, and will, I am sure, from the high character and attainments of its contributors, form no mean companion of the "Cyclopædia of Medicine," by Drs. Forbes, Conolly, and Tweedie, and to the Dictionaries of Professor Cooper and Dr. Copland; all which works are very justly and universally appreciated.

It would, also, be unjust not to record the fact, that anatomical science is much indebted for its present improved condition, to those individuals who have minutely studied and written on certain organs and systems of the body, in their isolated state; thus we may speak in unqualified terms of commendation and admiration of Sir A. Cooper's Treatise on the Testicle and Thymus Gland; and of Mr. Swan's unrivalled Monograph on the Nervous System, which is one of the most splendid and beautifully illustrated works, of this or any other country. The catalogue of authors on detached anatomical subjects, might be considerably extended, but as I have already alluded to many of them in the body of the first division of my report, I deem it unnecessary to say more on the present occasion.

The contemplation of the perfect body—the body in a state of integrity—as compounded of head, trunk, and extremities, and the viscera and parts connected with them, suggests to the mind another method of inquiring which is susceptible of the most important practical uses, viz. the THIRD DIVISION,

OR TOPOGRAPHICAL ANATOMY; the study of which involves considerations of the utmost utility to the physician and surgeon. The first work on this subject, which deserves to be recorded, and which may be said to have set the example to similar publications, is the Treatise on Surgical Anatomy, by Professor Colles, published in 1811; which was followed by a volume on the anatomy of the head and neck, by that admirable anatomist, and intrepid surgeon, the late Mr. Allan Burns; a new edition of which has been edited by Professor Pattison. England did not give birth to a systematic work on regional anatomy, at so early a period as Ireland and Scotland; but still, if we search the periodicals which appeared at that early part of the present century, we shall find many valuable papers on relative position, and its important bearings on practical and operative surgery. Numerous works have lately issued from the press, both at home and abroad, on topographical anatomy; but, in this country, we cannot as yet boast of complete systems, like those of Velpeau, and Blandin, although, on particular views of the subject, we can refer, with pride, to the volumes and papers of Green, Travers, Lawrence, Watts, Monro, Harrison, Dermott, Coulson, Hargreaves, Bloxam, Millard; and to the not less useful manuals by Bell, Shaw, Stanley, South, Mayo, and Tuson. Before concluding this brief sketch, I must beg to observe that it is very probable I have passed over many productions of merit; but I trust an apology will be found for the omission, in the almost utter impossibility of including all of them in this necessarily limited view of the present state of systemic and topographical anatomy.

My inclination would lead me to dwell a little longer on the interesting and important theoretical and practical studies connected with these two last divisions of our inquiry, but time forbids it; besides, it can scarcely be expected or necessary: for where can we cast the eye on the structure and mechanism of the human body, without finding interest and importance combined? It is impossible to regard it in the arrangement of its parts, or as a whole, without being forcibly impressed with wonder and admiration at the all-wise ingenuity displayed in its construction; and with the absolute necessity of our becoming thoroughly acquainted with it, with a view to the efficient discharge of those responsible duties which devolve upon us as guardians of the public health. It cannot, for a moment, be denied, that an acquaintance with the organization and natural functions of man, is the main-spring of that knowledge which will enable us to be useful to him, when he becomes the victim of disease. This is our peculiar province, and it is our gratifying duty, not merely to endeavour, on all occasions, to avert the fatal termination of disease, but, failing in the accomplishment of this object, it is equally our duty to try to assuage pain and suffering; to render the departure from life easy; and in this way to smooth the too often ruffled pillow of death.

In addressing the members of this Association, which is constituted of men whose daily and hourly avocations must impress them with the sublimity of the wonderful works of nature, as manifested in the organization of man, I have not thought it requisite to expatiate on the evidences of design displayed in

his conformation; and I may the more readily be excused for not having entered upon this pleasing subject, as many volumes, from the ablest writers, have recently appeared, under the name of "Bridgewater Treatises," having this point for their express object. But, although the main intention of my report has been to communicate the principal or leading facts connected with the physical nature of man, I have occasionally given vent to my opinions on his physiological and moral condition; and I have done this from believing, that such like digressions would lessen the tædium of anatomical detail, and serve to show the superiority of that being, to whom almost unlimited controul is given over the other works of creation.

Mr. Cooper observes, "it is not because man is erect in stature, and has two hands, that he is entitled to a separate and highly pre-eminent rank in the animal kingdom, but because he possesses the great faculty of reason, or judgment, which enables him to distinguish what is advantageous and useful, from what is inconvenient and pernicious. When this faculty is fully exerted, it raises man above the sphere of self-interest, and prompts him to aim at promoting the general advantage of his species. If this, his high prerogative, be duly considered, no argument will be required, to show that man is the master-work of the Creator's hand; and that whatever is calculated to establish the health, augment the comfort, and improve the condition of a being so richly gifted, and so highly favoured, cannot deserve to be otherwise regarded, than as one of the most interesting objects of human inquiry." If

this, then, be a just and faithful portrait of man, how much alive ought the members of the medical profession to be to all enquiries into his structure and properties; and how much more elevated, above all other occupations, is our calling, which obliges us to seek a minute acquaintance with the physical, vital, and moral constitution of this exalted Being? It is true, anatomy and physiology are not often made the theme of poetical enthusiasm, but they are susceptible of loftier purposes, and are subjects replete with interest, and the most consummate usefulness.

Conclusion.—I have now completed the plan which I meditated as most likely to meet the wishes of the members of this Association, who have been pleased to confer upon me the distinguished honour of drawing up a report "On the Present State of Anatomical Science;" and although I have given a mere outline, I flatter myself that the sketch includes sufficient to shew what has been done by modern anatomists, and how the science *now* stands. The arrangement which I have adopted, strikes me as being unobjectionable; as life and organization, the elements of animal composition, textures, organs, apparatuses, and, lastly, the organismus or perfect body, form a natural sequence; and the order is in unison with the division of anatomy into elementary, systemic or descriptive, and topographical. I am aware that, on the topics referred to, much more might have been added; indeed, I have experienced more difficulty from exuberance than from dearth of materials; but if I have been so fortunate as to have made judicious selections from them, I shall

obtain the only credit to which I am at all entitled. In fine, my endeavour has been to convey as perfect an exposition of the subject, as the time allowed me would permit; and although my report contains nothing very new, or very original, I am not without a hope that it will serve the purpose of a useful compendium of modern anatomical knowledge, and prove acceptable to those who take an interest in the history and progress of this delightful study.

The discoveries in anatomy have, of late years, been so brilliant, as to cause the science to assume the aspect of a new study; for at no period of its history has so much been achieved, as has been within the last thirty years. But although we are justified in ranking anatomy amongst the most perfect sciences, still it has not, as yet, reached such a state of perfection, as to justify a diminution of zeal in its prosecution. We have now no excuse for apathy: no excuse for the disgusting associations which we once were obliged to submit to, with the most profligate and abandoned of men: no excuse from a conscientious objection to trafficking in human flesh, and to disturbing the hallowed tomb; since, by the wisdom of Parliament, through the instrumentality of Mr. Warburton, and the zealous exertions of Dr. Somerville, in the execution of his trust, all these obstacles have been in great measure removed.

Much as we may boast of splendid modern achievements in anatomy, I feel convinced that a great deal remains yet to be effected; I would, therefore, exhort anatomists to an assiduous continuance of their researches; and, in conclusion,

permit me to express a hope, that it may be the happy lot of some members of this Association, to discover new facts in this interesting branch of knowledge, and thereby "add another, and a greener leaf to the wreath of British writers" on anatomical science.

PART III.

Essays and Cases.

REMARKS UPON THE PROGRESS AND CAUSES OF CHOLERA,

AS IT OCCURRED IN BRISTOL, IN 1832.

BY JOHN ADDINGTON SYMONDS, M. D.

Honorary Secretary to the Bristol Board of Health, Physician to the Bristol General Hospital, and to the Bristol Dispensary.

CHOLERA commenced in Bristol on the 11th of July, 1832. A solitary case, however, had occurred in one of the suburbs, in March of that year, and is interesting in connexion with the question of the importability of the disease. A seafaring man having made a sojourn of two or three days at Rotherhithe on the Thames, where cholera was then raging, removed to Bristol, and, on his arrival at the Hotwells, fell sick. During the journey, on the outside of a coach, on a very inclement day, he endeavoured to resist the severity of the weather by frequent recourse to ardent spirits. Soon after he reached his home, he was seized with diarrhœa and vomiting, and the next morning medical aid was called in. In the

course of a few hours the pathognomonic symptoms of cholera appeared, and the man died on the succeeding day. The appearances, on dissection, corresponded with those usually found in cases that have terminated fatally in the stage of collapse. Persons acquainted with the occurrence, naturally looked with anxiety for the appearance of other proofs of the presence of the fell disease in our neighbourhood. No other case, however, occurred at that time, though several months afterwards, when the epidemic was really amongst us, that vicinity was very heavily visited, being in a locality in all respects favourable to the generation and spread of the disease. Many persons were employed about the sick man, and the linen and bedding imbued with his evacuations, were (contrary to directions) not removed till several hours after his death. This circumstance is mentioned, only to shew that it was not any particular activity in the use of disinfecting measures, that prevented the production of other cases. The alarm consequent on the occurrence soon subsided; for the history of the case indicated that the patient had received the impression of the morbific agent in a distant locality, although he fell a victim to it here; and it was satisfactory to observe, that even on the supposition of the disease being occasionally contagious, the conditions were not present for the development of that property.

Although no other case of genuine cholera was known till July, there was a great tendency to diarrhœal disorder, as, indeed, there had been for some months before the occurrence alluded to. Practitioners remarked, that indigenous cholera was

more frequent than they had been accustomed to find it at any other season of the year except the autumnal. Towards the end of June, the number of cases of this kind increased very sensibly; and, in the first week of July, several individuals in the gaol were seized with suspicious symptoms; but no unequivocal example of the epidemic appeared in the city, till the eleventh day of that month. On the succeeding day Mr. Goldney, a surgeon, was called to a woman in Harford's Court, who presented symptoms of the disease, which, in the opinion of himself, and the other medical men who saw her, it was impossible to mistake. I shall not soon forget my own impressions on perceiving, almost at a *coup d'œil,* that the poor woman before me was in the hands of the long-heard-of pestilence. On the same bed lay a child, on whose physiognomy the disease was, if possible, more strongly marked than on that of the woman. On a table, in the the same room, was stretched the corpse of another child that had died the day before, as we were told, with precisely the same symptoms; and, consequently, this was, to the best of our knowledge, the first case that had occurred in the city. At that time Dr. Stevens' saline treatment was most in vogue, and it was immediately put in requisition, but without any beneficial effects: the woman died in eleven hours from the time of seizure; and the child in a shorter period.

A minute investigation was made into all the circumstances connected with the origin of the disease. No communication with infected persons or districts could be traced. The woman had removed to this

city, from Bath, a fortnight before, the latter place not having been invaded by the pestilence; and although she had been in company with persons employed about the shipping, as almost all the poor are liable to be in a sea-port town, it was impossible that she could have contracted the disease from them, as there was not a single case of cholera on board any of the vessels.

There had, for several days, however, been a great prevalence of the affections which, in all places, have preceded the actual appearance of cholera; some cases, indeed, of diarrhœa were so violent, that practitioners were deterred only by the absence of fatal terminations from reporting them as specimens of the epidemic. Thus there were, as we have already said, many highly suspicious cases in the gaol, where the disease afterwards raged with considerable severity. The atmospheric tendency was, therefore, perfectly evident. Now the locality of Harford's Court was precisely such as, *a priori*, might have been decided upon, as that in which the malady was most likely to be first developed; it comprehended the conditions most favourable to the manifestations of the *aerial constitution*. The court, as it is called, consists of six or eight houses, built facing each other, with an interspace so narrow that it should be called a passage rather than a court, the gable ends of each row terminating in the side of a street, the entrance from which is under a low archway. But the most baneful circumstance of the situation is, that the court stands on the bank of the river Froom, the character of which has been given in the topographical paper in the second

volume of these Transactions. In every house, and almost in every room, the nostrils were assailed by exhalations, which had arisen from this stygian stream.

Such was the spot where cholera first planted its foot. Diarrhœa had existed there for two or three weeks previously; and at the time when the woman was seized with the malignant symptoms, there was scarcely an individual in the court whose bowels were free from disorder. The cholera patients had been affected with looseness for several days, but, like the other inhabitants, had paid no attention to it. The latter, however, were persuaded to take medicine, though with some difficulty, for at that time an unaccountable apathy existed among the lower orders. No other malignant case occurred among the people in this court till the 17th, when the mother of the child who was the earliest victim, was attacked, but subsequently recovered. About the same time, a man fell ill, and also recovered. It must be mentioned, that the people were in a state of great wretchedness and poverty, and that many of them had subsisted on crude vegetable matter. I found one woman eating raw cabbage while suffering intestinal disorder. From these circumstances, it is most probable that there was at least a malign co-operation of local agents with the atmospheric taint; the existence of the latter being necessarily inferred from the absence of all proof of contagious introduction of the disease on the one hand; and on the other, from the fact that the same local conditions had often existed before, but failed to produce, unassisted, the pestilential disease that was now present.

Harford's Court did not, however, form a centre from which Cholera was to radiate: no other case appeared in the neighbourhood for a considerable time. But the disease had elsewhere commenced its ravages. On the 16th, the report from the new gaol contained a case designated spasmodic cholera, distinct from 39 cases of diarrhœa that had previously occurred, and of which two had died. The prison is situated near the southern boundary of the city, on the banks of the New River, and is distant at least a mile from Harford's Court. About the same time a single case happened on the Redcliff Hill, a furlong from the prison. But the next location of the disease was in Temple parish, which is the abode of very poor persons, and where it raged with great violence, especially in a part situated on the margin of the floating bason.* Soon afterwards it broke out in a district very remote from the latter, viz. in St. Augustine's parish, and particularly in Lamb-street, which is a low, damp situation, though not in the immediate vicinity of water.

Previously to this time, however, and almost simultaneously with its appearance in the city, the pestilence had been committing great havoc in one of the out-parishes (St. Philip's), at the south-east confine; a suburb, perhaps, unequalled throughout the kingdom for the destitution and misery of its population. Bedminster, another out-parish, only less populous and miserable than St. Philip's, suffered considerably, but not till the latter part of the visitation in the city. While speaking of the out-

* A large and populous portion of the city is intersected by this canal.

parishes, I may observe, that the out-parish of St. James and St. Paul was scarcely at all visited, though it comprehends many poor tenements; the majority, however, belong to persons of a middling or still better condition in life. Great exertions were made in this district for the supply of good food and clothing; for the enforcement of public cleanliness; for the distribution of cautions and directions respecting premonitory symptoms; and for the provision of medical relief on the first appearance of ailment. I ought, however, to state, that this district is further removed than any other part of the environs of the city, from the neighbourhood of water. The ground, also, is, for the most part, elevated.

By the end of August, all parts of the city had been invaded with more or less violence. The greatest number of cases reported on one day was 79, on the 17th of August; of deaths, 33, on the 15th.

In St. Peter's hospital, which is the poor-house of the city, the disease was very virulent: it commenced on the 24th of July, and ceased on the 20th of August. During this time 208 were seized, and 94 died; on the 5th of August no less than 15 deaths were reported. At this period the cases in other parts of the town were very few; for, on the 6th, out of 39 new cases reported to the board of health, 33 came from the above institution. The principal victims were aged persons.

From the middle of August the disease gradually declined, till the middle of November, when the city was completely free. The total number of cases, reported to the board of health, amounted to

1612; the deaths to 626. But there is good reason for believing that both of these statements fall short of the truth. It was well known that many cases occurred which were never reported; and on consulting the registers of burials, I found that the excess in the mortality of the period during which cholera prevailed, over that of a similar period in previous years, was considerably above the number of deaths ascertained by the board;* so that, even if we allow the same number to have died from other causes as in former years, which was, we imagine, far from being the case, there would still be left an amount of deaths, attributable to cholera, very far exceeding the official returns.

The conditions of the system which predispose to the reception of the disease, may be divided into natural and acquired. Under the former we shall consider age and sex.

From the annexed table (No. 1) it will be seen that, although a considerable number of cases were under the age of 15, those between that age and 50 constitute nearly two-thirds of the whole; while the smallest proportion are those above 50. It would not, of course, be right to judge of the comparative liability of different ages, from these numbers as they stand, without taking into account the proportion which they bear to the population.

The necessity of this precaution becomes evident by comparing the table No. 1 with No. 2. The result of this comparison is, that the relative numbers of the cases at the different periods do not correspond with the proportions of the population at

* See note, p. 180.

the same ages. Thus, the cases under 15 fall very far short of the large proportion of individuals living at that age; the cases between 15 and 50 decidedly exceed the ratio of that part of the population, the latter being considerably under a half, while the former constitute nearly two-thirds, of the whole. The nearest approach to a correspondence is at the age above 50; but still it is manifest that the numbers attacked with cholera at that period, are above the proportion of the population. The necessary inference is, that the intermediate period is the most obnoxious to the disease, and the earliest the least so. This result corresponds with our experience of the liabilities of different ages to other epidemics, such as typhus and influenza.

The tables, at first sight, indicate that females have been more frequent subjects of the disease than males. At the extreme ages there does not appear to be much difference in the liability of the sexes; but in the middle period the difference is very marked. Thus, the female cases exceed the male by 108; but, of this excess, 93 were between the ages of 15 and 50.

The same observation, respecting the sexes, has been made elsewhere: some have endeavoured to account for it, by supposing that the clothing of the one is more favourable to the impressions of cold; but this reason would not be applicable to cases that occurred in the months of July, August, &c. Were the fact established, I should rather be inclined to believe that the greater mobility or susceptibility of the female constitution to impressions of all kinds, morbific as well as others, would be the proper ex-

planation of it, especially as this condition is more marked between childhood and old age. No practitioner can have failed to notice the facility with which females are affected by atmospheric changes, especially with respect to its electricity. But there is no necessity for seeking interpretations of this kind; for if we again turn from the tables in No. 1 to No. 2, we shall find that, on comparing the proportion which the male cases bear to the female, with that of the sexual divisions of the population, a result is obtained of some importance; important, at least, in being at variance with the general opinion, which appears to be founded upon a consideration of the relative numbers of the cases in the two sexes, without reference to the population. The proportionate numbers of the cases, and the population, approach so closely, that we have no ground left us for supposing that females, at any one of the three periods specified, are at all more obnoxious to cholera than the other sex.

The *acquired* predisposing conditions were similar to those observed in other places, so that I shall do no more than state, that they may all be included under debility produced by some one or more of the following causes: intemperance, deficient or improper food, fatigue, anxiety, fear, living in confined rooms, &c. &c. The debility produced by previous diseases, especially those of long standing, has appeared to render the individual more susceptible; but how far real morbid action may affect the tendency to cholera I have not been able to ascertain. Judging from the analogy of other affections, we should expect that the presence of one

disease, especially an acute one, would be a cause of immunity from another. I cannot find that persons labouring under fevers or inflammations were attacked with cholera; but much reliance cannot be placed on this negative fact, "because there appear to have been very few instances of disease, excepting those occasioned, in some form or other, by the epidemic constitution."* Although, however, there is no reason to think that individuals under other diseases were attacked by the prevailing malady, yet such disorders as did appear, were noticed to be attended with diarrhœal or choleroid symptoms; just as during a typhus epidemic, inflammatory affections are apt to assume *the type* of the *prevailing sickness*.

Let us now direct our attention, for a moment, to the external causes of cholera; and first to the atmosphere. To say what meteorological phenomena are more particularly concerned in the propagation of cholera, is, I conceive, all but impossible. No investigation appears to me attended with more indefinite, unsatisfactory, or even contradictory results. In this place the disease appeared, at one time, to be assisted by moist muggy air; at another, by great heat and dryness; now it would seem checked by cold; and now, having diminished during several warm days, it would increase when the weather had become colder. The opinion which I have come to is, that there are no appreci-

* How does this agree with the statement concerning the excess of deaths at this period, (over and above those occasioned by the epidemic) compared with those of corresponding periods in previous years? (See p. 177.) Or does it prove the great inaccuracy of the reports? If so, all conclusions drawn from them must be involved.

able atmospheric changes, of which it can be predicated that they are more frequently associated with the presence of that miasm or poison (whatever it be) that is conveyed by the atmosphere; but that it is probable that there is a succession of certain changes, which may so operate on the body, as to make it more liable to the disease.

With regard to soil, I think there is little doubt that lowness and dampness of situation are favourable to the epidemic. It is true that persons living in such situations in this vicinity, are more under the influence of other predisposing causes also; but still there is good reason to believe that they have been more frequently attacked than persons in other respects similarly circumstanced. The same may be said of persons situated near offensive drains, and other causes of noxious effluvia. It is a general opinion that the disease prefers the vicinity of water, whether running or stagnant; but it is hard to say whether this opinion can be supported by the history of the epidemic here, since the city is so intersected by rivers or canals, and the worst dwellings are on their margins. Concentration of human effluvia, from the herding of great numbers of individuals in a small space, has, I think, unquestionably been the most influential agent in propagating the disease, when it has once established itself in such localities; but I cannot say that this circumstance has appeared to attract the pestilence. At all events, if this be the rule, there have been two remarkable exceptions in this district: thus, Marsh-street, the abode of the lower Irish, and one of the most thickly-peopled parts of the city, was the last

place visited; while in Lewin's Mead, which, because it labours under the double disadvantage of a low situation and a crowded population, was expected to be one of the first and most heavily visited localities, only a few sporadic cases occurred.

Anxious to form some definite opinion upon the much-agitated question of contagion, we endeavoured to study the facts bearing upon it, with due attention, and to draw our conclusions with caution. The evidence which we were enabled to collect in this city, goes to prove—1st, that cholera may begin and propagate itself independently of any contagious property, and that the property of communicability is frequently absent; but, secondly, that occasionally something emanates from a body affected with cholera, both before and after dissolution, which has power to induce the same disease in an individual, who comes within its reach before it has been much diluted.

The facts in support of the first propositions, are these:

(a) There was not the slightest reason to suspect that the person first attacked on the 11th of July, had been exposed to infection.

(b) The disease broke out in distant parts of the town, without any communication being traceable, and in some instances almost simultaneously; in scarcely any instances did it appear to spread by continuity.

(c) Even in a limited space, as in one street for instance, it would rage, at the same time, in sets of houses, comparatively remote from each other; the intermediate dwellings being quite free, although

the circumstances of intercourse between the inhabitants were equal.

(d) It often happened that individuals, having staid long enough in a diseased locality to contract the malady, did not introduce it into their own neighbourhood, in which they lay ill and died; and the same was true of many who fled from an infected district, and were seized, in their new abode, two or three days afterwards. The case of the sailor who had been in London, and died at the Hotwells in the month of March, is a remarkable instance of the kind.

(e) Not a single medical man was attacked with cholera, although most of the profession, engaged with the disease, experienced a diarrhœa, which they attributed to the combined effects of fatigue and atmospheric influence.

The second proposition is supported by the following circumstances:

(a) Scarcely a single nurse, or other attendant, at the hospital, escaped the disease in some form or other: the men employed in carrying the sick in baskets to the hospital, were extremely subject to the disease, and particularly the bearers of corpses: individuals who, in the agony and distraction of grief, had clasped the dead bodies of their friends or relatives, often sickened very shortly afterwards.

(b) Persons approaching the bedsides of very malignant cases, or passing the corpses carried out of the wards of the hospital, were sensible, not only of a very peculiar odour, but also of sudden nausea, *malaise,* an indescribable gloom, and frequently spasmodic twitchings of the muscles of the face and

extremities. Patients, to all appearance convalescent, would suddenly relapse, soon after the introduction of a very bad case into the next bed, as if from a reception of a second dose of the poison.

(c) The persons first attacked in a part of a parish, had, in some cases, been in communication with the sick elsewhere.

(d) A girl became ill, and was removed to Thornbury, about nine miles distant; her complaint proved to be cholera, but she recovered. Her mother, however, who had not been in Bristol, fell ill of the same disorder, and died. The malady did not spread in consequence, as the residents adopted very strict measures of seclusion.

Of the first and second of these statements, it may, perhaps, be said that fatigue, intemperate habits, or depressing passions, are sufficient to explain the facts, without supposing that contagion was concerned in the causation. This is, without doubt, partially true, but the greater frequency of attacks among the persons referred to, (allowing for the other circumstances) impresses me with the belief that they suffered from exposure to some emanation from the diseased bodies.

There was no satisfactory light thrown upon the question, by the mode in which the disease attacked families. In some instances it did not seize so many members of a family as might reasonably have been expected, merely from their exposure to the same endemial circumstances, without reference to contagion; while in others it would visit a household in a most unsparing manner, so much so, as to induce the conviction that there was a peculiar family predisposition.

Our experience of other exciting causes, as cold, damp, fatigue, intoxication, &c. has corresponded with that in other places. Although the disease raged here in the fruit season, it was not clear that the persons attacked had indulged in this article of food more than those who escaped. *Fear,* we have mentioned as a predisposing cause. *Fright* often appeared to be the exciting cause of an attack. The following is an instance: A gentleman who had manifested, during the prevalence of the epidemic, no small apprehension of cholera, although resident in a locality in which no cases had occurred, was one evening returning from a drive, when the intelligence was somewhat abruptly conveyed to him, that a lady of his acquaintance, whom he knew to have been scarcely less apprehensive than himself, and to have taken equal pains in avoiding cholera, had died of the malady: he almost immediately sickened, and in a few hours was a corpse.

It is not my intention to describe the general symptoms which the disease presented in this locality, as it would be a wearisome repetition of a tale that has been told a thousand times from different parts of the country. In all the essential phenomena the disease has corresponded with the descriptions of it given elsewhere; I shall, therefore, content myself with touching upon one or two circumstances that appear to me to be more particularly deserving of notice.

The first of these is the very early occurrence of spasm in some cases. This symptom is almost universally described as *consequent* to the gastro-enteric disturbance; but as I had always entertained doubts

as to the spasmodic and collapsed affections being the direct sequels of the disease of the mucous membrane, I made enquiries of patients themselves, as well as of medical attendants, concerning the period at which spasm first manifested itself. The result of my investigation was, that in a considerable number of cases this symptom was the *first* that occurred, although, from its slight degree, attention was not directed to it till it became complicated with the diarrhœa, and had increased in intensity. In some, this spasmodic affection was confined to the fingers; in others, it pervaded the muscles of the extremities and the trunk. One gentleman informed me, that he was called to a woman violently affected with cramps, but without any other symptom of cholera. He bled her, with temporary relief, and the blood was cupped; but, soon afterwards, rice-water dejections appeared, and she passed rapidly into fatal collapse; an occurrence not uncommon after venesection. I have mentioned that attendants at the hospitals were often affected with slight cramps, but without any worse consequences, just as others experienced diarrhœa that went no farther: probably, in each case, from the opportune application of remedies.

The occurrences in the *consecutive fever* are interesting, inasmuch as they differ very remarkably from those observed in other fevers. This stage of cholera has often been called typhoid, and in some respects it very closely resembles typhus, viz. in the local determinations with depression of power; but there is a marked distinction in the rate of the circulation, and in the state of the urinary secretion.

The former has never, in my observation, exceeded 110 pulsations in a minute, while the volume of the artery has been expanded and compressible; the latter has invariably presented the same appearance as in health, being of a straw colour, and not depositing any sediment. There is also something more unmanageable in the local determinations; they appear to consist of a deranged capillary action, quite *sui generis*, which, while it neither excites the general circulation, nor appears at all amenable to any impression made upon the latter, at the same time produces all the mischievous effects of inflammation.

Of the cases which, under my own immediate observation, survived the cold stage, at least nine out of ten passed into the febrile affection. Some practitioners did not find the frequency of this occurrence so great; while others affirmed that all cases which did not terminate in the blue stage, were attended with the peculiar fever. Much, I think, depends on the character of the seizure; the probability of the affection under consideration being in a direct ratio with the severity of the earlier symptoms. It is the opinion of many, that the previous treatment has much to do with the consecutive fever; some considering it the result of stimulants; others of calomel. I believe, myself, that it is by no means essentially connected with any plan of remedial management, and that it will occur after every kind of treatment, but that some agents, employed in the removal of the cold stage, have a tendency to aggravate the fever. While there can be little doubt that the large quantities of calomel

administered, sometimes increase the inflammation of the alimentary canal, I am not, on this account, disposed to give up the calomel treatment, inasmuch as it appears preferable to bring the patient into the danger of the consecutive fever, than to allow him to die in collapse. If stimulants were of any benefit in extricating the patient from this stage, we ought not to be deterred from their use, merely on account of their tendency to increase determination to the brain.

It is deserving of notice, that relapse from the febrile into the cold stage occasionally took place; the stools having been bilious, would again assume the peculiar rice-water appearance; the urine having returned, would be again suppressed; while the surface would become as cold as marble; and I need scarcely add, that such cases were almost uniformly fatal. In a paper which I had the honour of submitting to the central board, upon the Treatment of Cholera, in conjunction with Dr. Carrick and the late Dr. Kentish, I alluded to the suddenness with which two or three patients at the hospital were hurried, from apparent convalescence, into mortal collapse. They rose from their beds, dressed, conversed jocularly, and almost instantly fell into the condition from which they never recovered. It is unnecessary to dwell upon the subject now, more especially as I have been unable to collect any thing that would diminish the obscurity in which such facts are involved.

I regret my inability to offer any remarks upon the morbid anatomy of cholera, derived from an *extensive* series of examinations. The appearances

in the few bodies that were examined, differed, of course, very essentially, according to the period of the disease at which death took place. If the patient was cut off in the cold stage, signs of congestion were manifest in the venous system, with fluidity of the blood; the veins of the pia mater were loaded, and liquid blood oozed from incised portions of the medullary matter of the brain if pressure was applied; the lungs, and the large venous trunks in the thorax, were gorged; so, also, was the liver; while the intestines seldom or never presented this condition, but appeared unusually pale. These viscera were always filled with a thin yellowish green fluid, and on their mucous surface was observed a white pasty substance, the membrane itself being soft and easily detached by the scalpel. The gall bladder was turgid with bile, while the urinary bladder was uniformly contracted, and perfectly dry on its inner surface. Of the general aspect of the bodies it is unnecessary to speak, as it in no respects differed from that which has been graphically enough described by all good writers on cholera.

If the patient had sunk in the consecutive fever, the post-mortem appearances corresponded with the previous symptoms of determination, according to the nature of which there would be found opacity and thickening of the meninges of the brain, with effusion of serum; in the bronchial tubes, a violet hue of the membrane, and a viscid varnish of mucus; in the stomach and intestines, various degrees of injection of the mucous coat, from the most vivid redness to the deep colour of mahogany, together with *ramollissement* and denudation.

Concerning the pathology of this disease, I will only venture to say, that I do not believe that any one part of the system can be looked upon as its essential seat; and that I incline to the opinion entertained by more than one, that the various phenomena are the results of a poison acting *directly* on the different organs, and are not the mere *sequels* of the affection of the part first impressed; but I doubt not that they are all liable to be increased in malignity by the complication or order in which they occur. If the order were uniform, it might fairly be supposed that the first derangement of the series is the cause of the succeeding ones, but that is not the case.

The mortality of the ages appears, from the tables No. 1, to be least between 15 and 50, and greatest above 50. Such a result might, *a priori*, be expected, for reasons sufficiently obvious.

There is no great difference in the mortality of the sexes. Under 15, it is about equal; between 15 and 50 the cases are more fatal among the males, while a reverse of the proportion appears at the period above 50.

The mortality was not less at the close of the epidemic, than at any previous period of it; in fact, the last set of cases was more fatal than any that had occurred before. It should be mentioned, however, that they occurred in individuals, than whom it would have been impossible to have selected worse subjects for the disease. They were some of the unfortunate lower Irish, residing in Marsh-street: degraded and filthy in their habits, subsisting on the most scanty food, and that of the worst description;

miserably clad, and herded together in dark, ill-ventilated rooms. Out of sixteen seized, between the 24th and 26th of October inclusive, and taken to the cholera hospital, no less than eleven died; and of these, eight died within twenty hours, and the other three in less than twelve hours. It is remarkable, that we could not discover that in these cases premonitory diarrhœa had existed: twelve out of the sixteen came from two adjoining houses.

I cannot conclude without expressing my obligations to the gentlemen who acted as medical inspectors, under the direction of the board of health, for many valuable facts, upon which a great number of the observations contained in this paper are founded.

No. 1.—TABLES shewing the ages, sexes, &c. of the cholera cases and deaths, reported to the Bristol Board of Heath, 1832.

UNDER 15 YEARS OF AGE.

			MALES.		FEMALES.	
	Cases.	*Deaths*	*Cases.*	*Deaths*	*Cases.*	*Deaths*
Treated in Hospital	134	70	67	35	67	35
In Patients' dwellings	234	89	115	44	119	45
Total	368	159	182	79	186	80

FROM 15 TO 50.

			MALES.		FEMALES.	
	Cases.	*Deaths*	*Cases.*	*Deaths*	*Cases.*	*Deaths*
Treated in Hospital	285	131	125	65	160	66
In Patients' dwellings	664	159	303	74	361	85
Total	949	290	428	139	521	151

ABOVE 50.

			MALES.		FEMALES.	
	Cases.	*Deaths*	*Cases.*	*Deaths*	*Cases.*	*Deaths*
Treated in Hospital	130	86	60	40	70	46
In Patients' dwellings	165	91	82	44	83	47
Total	295	177	142	84	153	93

	Total Cases.	*Total Deaths.*
Males	752	302
Females	860	324
Total	1612	626

The cases which occurred in the out-parishes are not included in these tables.

No. 2.—A TABLE shewing the ages and sexes of the population of the city of Bristol, according to the census of 1831.

	Under 15.	*From 15 to 50.*	*Above 50.*	*Total.*
Males	10575	11904	3752	26231
Females	11650	16181	5012	32843
Total	22225	28085	8764	59074

The population of the out-parishes is not included in the above statement.

No. 3.—TABLES shewing the periods of the disease at which 466 deaths occurred, together with their ages and sexes.

IN THE COLD STAGE.

	MALES.		FEMALES.		TOTAL.	
	Under 15.	*Above 15.*	*Under 15.*	*Above 15.*	*Males.*	*Females*
Died in Hospital	31	76	25	84	107	109
In Patients' dwellings	24	57	19	63	81	82
Total	55	133	44	147	188	191

IN THE CONSECUTIVE FEVER.

	MALES.		FEMALES.		TOTAL.	
	Under 15	*Above* 15.	*Under* 15	*Above* 15.	*Males.*	*Females*
Died in Hospital	6	19	10	26	25	36
In Patients' dwellings	1	9	5	11	10	16
Total	7	28	15	37	35	52

In the cold stage	379
In the consecutive fever.....	87
Total	466

AN ACCOUNT

OF

THE SCARLATINA,

AS IT APPEARED IN THE TOWN AND NEIGHBOURHOOD OF BEACONSFIELD, IN BUCKINGHAMSHIRE, IN THE AUTUMN OF 1832.

BY NATHANIEL RUMSEY,

Member of the Royal College of Surgeons of London, and Surgeon at Beaconsfield.

During the fine weather, early in October and November of 1832, the scarlatina made its appearance at Wooburn, having been introduced there by a young gentleman from school, and first attacking a man servant. It extended only to one other servant in the same house, and did not appear any more in the neighbourhood at that time. Two miles off, another case occurred, which proved fatal, and from which my son took the disease, in attendance, passing through it with serious symptoms. From him an attendant caught it: but now it began to appear at Beaconsfield, in persons who could not have been known to receive it from others; some of these, however, communicated it again. It would happen that some cases of sore throat and fever, *without eruption,* would occur, and yet prove

contagious. A maid servant, so affected, gave the complaint, without eruption, to a fellow servant; and this to a nurse; and she to a fourth person in the same house: the latter being a woman 70 years of age.

That these cases differed not essentially from scarlatina, would appear from the fact, that contagion and some of the sequelæ, incident to that disease, followed in these cases; such as the stiffness and swelling, with pain, of the articulations. It was several times seen that, in the same house, some would have the sore throat, fever, and eruption; while others had the two former without eruption. The weather continued mild, often raining, with a humid atmosphere; and it appeared to me that the number of cases increased, as the atmosphere assumed a humid and mild character. Several facts occurred, which rendered it probable that the disease was occasionally hastened by, or, perhaps, actually dependent on, exposure to wet and cold; a previous and continued exposure to infected persons having been inadequate to its production; thus, a residence in a sick family seemed to have become only the predisposing cause, changing place with the exciting cause; while the circumstances which, on other occasions, gave only predisposition, viz. wet and cold, excited the disease. A tradesman, for example, having the disease in his family, and nursing his children, escaped it himself for a fortnight. He became wet through, when on horse back for some hours, and immediately fell most seriously ill with the disease. The indisposition followed the exposure in such a way, as to wear

the appearance of growing directly out of it. This exchange between the two causes, viz. the predisposing and exciting, has been remarked to subsist in other contagious diseases.

The disease commenced sometimes in three or four days after exposure to the contagious miasma. My son fell ill on the fourth day after visiting his patient. A poor woman came, by a fatiguing journey, from a healthy house, to visit her sister, whose family were suffering with the disease. She became ill in less than four whole days after her arrival, and died. About this time there had been a considerable prevalence of small-pox, and some of spasmodic cholera, and much of the well known cholera of this country. The disease, with eruption, fell upon all ages, from infancy to that of 40 years, and in one case to that of 53; the complaint, without eruption, attacked, in one instance, an individual upwards of 65 years old. The subjects attacked were servants and trades-people; scarcely a pauper, and but few persons of better rank, or any members of their families, for the first few weeks of the epidemic.

The symptoms ushering in the disease, were a slight sense of soreness in the throat, the tonsils and velum pendulum being red, often with a yellowish slough, and sometimes with a coat of aphthous-like exudation on the surface; the exudation going off, would leave sloughs more or less deep. There was more or less bleeding from the nose, giddiness, pains of the legs, head and back, with frequent retching. Sometimes the mere food would be thrown up, and at others, the food tinged with green bile. In one case, which proved rapidly fatal, with

symptoms of great prostration, it was ushered in by aphthæ in the throat, without any symptom to distinguish the disease for six and thirty hours afterwards; so, that it had proceeded to almost a fatal termination, without the character of scarlatina.

The pulse would usually be about 120 after the first day. The tongue being at first of a greyish white colour, and moist; often on the second day, and later, having a browner broad stripe down the middle to the tip, with dryness. The eruption would appear in about forty-eight hours, often sooner, after the disease commenced, being preceded by an unequal redness of the face and arms, without the stigmata of a rash, or the equal colour of a flushed skin: so that by this patchy redness, it might sometimes be predicted that an individual would soon be the subject of the disease, before he had actually become so.

In several cases the bursting out of rash was accompanied by well marked nettlerash blended with it. The glands under the jaw were tender from the earliest stage, a circumstance calculated to assist the diagnosis, in such cases as might be confounded with measles. The conjunctiva was red, and in many cases a defluxion of thin ichor was poured out from the nostrils. It would often happen that very early, as on the first, second, or third day, there would be a great and alarming sense of weakness, seeming to be a degree of collapse, rather than debility produced by exhausting symptoms, or the known and usual depression of fever. This depression was known to go off without the assistance of stimuli, in one or more cases; which I

mention as favouring the opinion that it differed from exhaustion. It is an alarming feature in the disease, and often bids defiance to our most vigorous employment of cordials. The weakness which has its corresponding, and intelligible causes, is one thing: that which sets our powers to explain it at defiance, and is related, probably, to some principle connected with the hidden physiology of nerve, and which is called collapse, is another; and their distinct nature should be seen, in order to enable us to form a rational prognosis. In other cases the depression was too excessive to admit of any delay in the most vigorous use of cordials. The tongue would acquire a thick coat, which in one instance was very rapidly formed, and bore a resemblance to aphthæ. There would be, in some cases, a little hoarseness and cough, and often, on the decline of sore throat, a very troublesome and irritating cough; but a most strikingly smaller propensity to catarrhal affection than is seen in measles. The urine was sometimes copious and pale during the first twenty-four hours. The appetite upon the access of the disease ceased. On the second and third days the skin became hotter, but seldom, I apprehend, exceeding 103° of Fahrenheit. The inflamed throat, in the *less favourable* cases, would assume a dark red hue, its vessels readily giving way, and bleeding, if touched with a spoon. If the tonsils were enlarged and firm, of a light red colour, suppurative inflammation was to be expected, more than malignancy, and affording a more favourable prognosis. Viscid and troublesome mucus would occupy the fauces. Observation confirmed the otherwise reasonable

conclusion, that a bright red eruption was more favourable than that of a livid hue. In some, the eruption would be coarse and patchy, more or less distinct, growing browner on the fourth or fifth day, and then going off. I observed in several instances, and have formerly noticed the same fact, a return of a well characterized eruption, more than a week after its disappearance. I have usually considered the rash to bear a tolerably exact proportion, by its extent and intensity, to the violence of the other symptoms; much rash being connected with much fever, and extensively affected throat; and, indeed, proving the converse of a vulgar notion, that the rash, by its appearance, was a relief to the other symptoms. One most serious exception to this, however, must be noticed, which occurs when the debility is so extreme as, by the depression of the vascular action of the surface, to defeat the usual course of nature in establishing that energy which is necessary to develope the rash. Some cases occur in which there is no internal evidence of the specific disease. The state of the neighbourhood, the state of the family, the duration of the disease, the termination in death, are sometimes the only circumstances by which to decide the question. I was called up, at two in the morning, to a child, eight years old, in great agony in the bowels, with an extremely feeble pulse, and whitlows on almost every finger, The bath, wine and other cordials failed to rally it; the bowels became easy and relieved, but it died in a few hours in a state of collapse. That this was the effect of the depressing power of scarlatina, I believed, because, at a stone's

throw from the house, seven individuals were ill with that disease; one of them a child, having almost every finger's end affected by whitlow, running *pari passu* with the disease. During the use of the bath, in this case, a blotchy redness appeared, an attempt, as it were, to establish eruption. It is in such cases as these that I should rejoice to see eruption, in spite of my remark, that in proportion to the rash is the disease; simply because I should regard it as evidence of improving power; death being threatened by collapse.

I observed nothing in the alvine discharges peculiar to this disease, or differing from what any continued fever might present. In one case the motions had a dark brown hue, with, as it appeared, an overload of bile; in which I gave and repeated an active purgative, when the subsequent motions became of a proper colour; the previous evacuations having had no striking influence upon the case. It happened in several cases, as I have before, on other occasions, observed, that violent cholicky pains would come on. These have been sometimes relieved by the warmth of glysters; I believe, also, that they are relieved by antispasmodics; yet I would earnestly recommend, upon their occurrence, a careful investigation into the accompanying symptoms, lest they should, in certain individuals, have the inflammatory character, and end in corresponding consequences. There is no doubt that this remarkable pain has a peculiar relationship to the disease. I have witnessed its occasional connection with it ever since I was a student in medicine, and for the first time, in the year 1811. From the fourth

day the tongue would, in some cases, become fissured, and the teeth more or less covered with black sordes; these having continued a day or two, would be accompanied with delirium, talking incoherently aloud, picking the bed clothes, and the skin; and, in some, a marked propensity to sleep over much was striking. One case ran on to three weeks, with much resemblance to typhus. There was often much snoring. In a few cases there was very little sore throat; the other symptoms running high: the general symptoms were not the effect, therefore, of the sore throat. A very distressing difficulty of breathing arose in one case, accompanied with hoarseness, as if from inflammation of the trachea; yet there was such depression of strength, that it seemed impossible to adopt the idea of bleeding. This patient died about the fourth day of the disease. The nose sometimes became obstructed by a thick mucus; and if any carelessness was used with regard to exposing the body, a thin fluid would escape, irritating the angles formed by the alæ nasi. The mouth, at the same time, would become loaded with a very viscid secretion, incommoding the breathing and swallowing. In one case in which there was no eruption, an almost incessant, copious, and very remarkable spitting of frothy saliva continued for forty-eight hours, much harrassing the patient, an athletic young man of 25. The throat was red and swollen, but free from slough or ulcer; the external glands were tender to the touch. The pulse was soft and weak. A wound which had been made by accident in the leg, and was going through the healing process, now inflamed; then the granulations

were absorbed, or died, the whole surface becoming a slough, while a very copious discharge, of a bloody and thin serous fluid, thoroughly wetted the dressings, instead of the healthy pus which had before existed. At first, two grains, and afterwards one, of opium were exhibited, with two scruples of cinchona, every four hours, with as much nourishment, including wine, as the stomach would receive comfortably, which very obviously and quickly arrested the symptoms, and lessened the inflammation of the throat. In the unfavourable cases, at the period when a favourable crisis might otherwise have been expected, the submaxillary glands would become again more tender and large; the cheeks swelling and shining; the breath offensive and short; and rapid dissolution would now and then take place. Besides the occurrence of this renewed inflammation, scarcely interrupted from the beginning, it often happened that a patient, having passed through the disease easily, might remain well, and free from local inflammation, for a week or ten days, and then become again the subject of it, excited by imprudent exposure to an open door, or partial exposure of the skin, as in children with uncovered arms or legs. Too much importance can hardly be given to this tender and susceptible state, which continues for a considerable time without any outward manifestation, and so against probability, that it is not easy to persuade parents and nurses to be sufficiently careful. I saw this re-excited affection occur in succession, in three children of the same family, entirely the effect of incredulity on their susceptible state. One of them narrowly escaped; and another, whose

primary disease had been very slight, died. The articular pains were often severe, accompanied with redness, swellings and tenderness, seldom lasting very many days; beginning from the sixth to the tenth day, and not to be distinguished from rheumatic fever, except by their duration, which never exceeded, in the worst case, ten days. In one case, the first two days of fever were followed, on the third, by an alarming collapse, the arms being cold and sweating, the chest covered with very dark petechial spots, the mind clear and entire, and death soon following. In another case a gentleman, aged 53, of very intemperate habits, died in twenty-four hours after seizure, with very little sore throat, but distinct eruption. The delirium was, in four or five cases, furiously violent and raving, like that of a maniac, yet not always ending fatally. In one of the many cases, during the epidemic, in which a secondary affection occurred, consisting in a renewed swelling of the external glands, with returning fever, there was a most offensively sloughy state of the throat, ending fatally. It is quite clear to me that the disease leaves a predisposition to inflammation, more particularly of the submaxillary glands, of the tonsils, velum, and cellular membrane, but not excepting the liver, and viscera in general, sometimes accompanied with the scarlet eruptions a second time. This second eruption I have occasionally seen for some years past; an eruption perfectly distinct from hæmmorhæa petechialis. A child had the disease slightly, and ten days after its disappearance, fell ill, with enlarged and inflamed submaxillary glands and tonsils, much fever, and

more serious illness than the original one, which had left the predisposition to become so affected, by a short exposure to cold when apparently well. Another child, having passed through the eruption, and having been well about ten days, became ill, with tender swellings under the jaw, and much fever. There is obviously an analogous tendency to inflammation of the lungs, and especially of the trachea, after measles. I have several times seen the epidemic prevalence of croup, succeed the epidemic measles: and the persons affected with the former, had had the latter in a sufficient number of cases to warrant the belief that the predisposition to the one, had been given by the other. A very excellent account of the croup, as it appeared at Chesham, in 1793, by my most respected relative, Mr. H. Rumsey, sen. related in the Medical and Chirurgical Transactions, vol. 2, page 25, contains a note, stating that the measles had been very general before the appearance of the croup. In two or three cases general œdema has occurred. Scarlatina has a great propensity to run into debility, and at very different periods: I think I might say, more especially from the third to the sixth day, but, certainly, sometimes earlier. This disease has committed great ravages in the neighbouring towns. In this town, four children have been seized in one house, of whom three died.

I have heard the bark strongly advocated for the cure of this disease, under the theory that the fever and general symptoms were entirely the effect of erysipelatous inflammation of the throat. I believe this theory to be wrong, and the practice often in-

jurious. The former, because the disease sometimes proceeds to a fatal termination without sore throat; the latter, because fever of an inflammatory type is often an attendant. I have heard general bleeding equally advocated; but have not, myself, been able to proceed in practice, upon any but general principles: that is, to avoid excitement, and, even, to lower the force of the circulation, when it was too high, and the general condition not marked by tremour and nervous affections; and, on the contrary, to support the strength, by bark, wine, brandy, æther, opium, &c. given under a cautious and watchful eye, when coldness, tremours, and feeble pulse, existed. Most cases, though not all, will admit of gentle purging during the first two days, the use of saline medicines, rendered sudorific by antimonials, refrigerant gargles, with the affusion or ablution, with an evaporating lotion, of the submaxillary glands. I found that leeches might be often used with great hope of usefulness, if the skin was hot and the pulse had strength. Caution, however, was necessary in the cases of young children, during this epidemic, for I believe that every drop of blood lost, beyond the useful quantity, told, in a later period of the disease, much against the little patient. I would by no means, however, wish to be understood to believe that bleeding by leeches is an unimportant remedy. During some epidemics there are many cases, nay, a large proportion of the serious cases, that require them; and I have known the draining by leeches, for some hours, followed by the happiest effects. The matter is, to decide rightly in each particular case. To determine the precise degree of depres-

sion, when they were improper, appeared to me to be a nice point in this epidemic, as leading to one of the most important features of the treatment. To lower the temperature of the throat externally by evaporation, appeared to me to be preferable to blisters, and highly grateful to the patient. I never met with a clear demonstration of the usefulness of blisters, but often of their trouble to the patient; nevertheless, I occasionally employ them. I include, in my remedial treatment, a constant confinement to bed, and a careful and frequent observation of the temperature of the body; taking off or adding covering; drawing and undrawing curtains; admitting or excluding the light; renewing or extinguishing the fire; keeping it clear without smoke; enjoining, with peculiar urgency, the recumbent position, as soon as any characters of great debility have appeared. I consider it to be very important to admit so much fresh air as that the rooms shall never be close; and to this end I advise the removal of carpets and superfluous furniture. The rooms should be wiped, both walls and floor, for the purpose of removing dust, as the dust, I think, has an effect in disqualifying the air for respiration. In the advanced stages of the disease, and under the circumstances of collapse, a most rigid economy of strength should be used. The throat should be inspected without much disturbance to the patient; and children should not be struggled with when they resist, unless it be clear that there is a great necessity for inspection. Opiates, to procure rest and allay irritation, as circumstances dictate, are useful. It is not uncommon to find, in the early stage of the

disease, before the strength has been exhausted, a pulse of full volume, which, with the accompanying hot skin and flushed face, might, in other circumstances, suggest the necessity of general bleeding. It would be right, however, in this disease, to subject these symptoms to strict scrutiny, in respect to other attendant circumstances and appearances. It should be ascertained whether the sensorium is affected by any the slightest deviation from its usual integrity; whether the memory fails, or a remark is made twice over; whether there is any tremour of the muscles, or subsultus tendinum; whether the erect position of the trunk, in bed, hurries or weakens the pulse, or the countenance grows pale under it; whether all or any of these circumstances happen in the slightest degree. Such a test of diminished strength is the best that I know, and should, in my opinion, if such characters exist, guide the practitioner to avoid lowering the system by active or negative means; especially if there be an epidemic, which may have exhibited cases, in which great and serious depression of strength had spontaneously come on. I have, witnessed the mischievous effects of lowering a patient too much in pneumonia, where the case has been accompanied by sensorial disturbance and muscular tremours, even in the athletic and youthful. There is, then, in scarlatina, a state which might be called a mimicry of plethora and strength, while the disease is, nevertheless, on the verge of collapse, and the pains to be employed for the discrimination cannot be too carefully insisted upon. Such was the tendency to debility, in this epidemic, that but very few cases occurred suited to

cold affusion or ablution, usually a very valuable remedy to lessen the preternatural heat, itself, a pabulum of the disease. A patient lying upon his *back*, will have more eruption, and of longer duration, on that part, than elsewhere; the extremities, which are comparatively cool, having less eruption.

Where the worst forms of this disease are fatal in so large a proportion as I have witnessed in this epidemic, it must be admitted that they are in their nature but little curable, or ill understood, or that therapeutic principles are not, hitherto, well adapted. Such calamitous circumstances ought to excite the physician to anxious and diligent reflection. The alarm, in these cases, often comes when the powers of life are gone beyond the reach of remedy. It is not improbable, however, that a minute, active, and judicious attention to the early symptoms of the case, might supercede the more dangerous ones which follow. A correct theory of the disease is, of all things, desirable and necessary to this end. I do not believe that it is simply or essentially inflammation of any viscus or viscera, or of any texture or textures. I do not believe that it is simply or essentially debility of any particular organs, or any particular textures, or of the system generally. I believe that the miasma having applied itself successfully, as regards the production of the disease, may give rise to any degree of debility, or collapse, and, at the same time, to local inflammation or inflammations, in no certain proportion to the debility; that both of these principles may exist, at the same time, in a degree to prove fatal; or that one of them only may constitute the fatal cause, and thus,

being in their pathology opposite, as regards remedy, it is matter of great nicety and importance to select and encounter that which threatens most; it being necessary often to make the selection for almost exclusive application of remedy. The characters of debility, which no existing symptoms can satisfactorily explain, are often so striking as to suggest the distinct notion of collapse, as arising from some unknown cause or causes, which I have before ventured to state. Having watched the declining and dying moments of several patients in this epidemic, I am inclined to think that the debility, or collapse, is itself often fatal; and that the lesion of particular organs essential to life, produced by inflammation, promotes the unhappy termination by contributing to the debility, in so far as these organs cease to minister to the strength of the system, which, in health, they helped to furnish. I would select the following case to show that debility, properly so called, may constitute an essential part of the disease. T. E. a fine young woman, aged about 17, was seized with vomiting, which continued through the whole day, before any remedy was sought; the next twenty-four hours passed in attempts to allay the irritation of the stomach; the pulse being very feeble, and the countenance sunk. At the end of forty-eight hours, the debility having been very alarming, so that the act of swallowing, or speaking, produced a hurried or panting respiration, the stomach became quiet, and cordials were kept down; the warmth returned, the pulse improved, the eruption reappeared, and the intellect became clear. This improvement, however, lasted but a

little while, the patient dying of collapse in less than three days. I conceive that, in this case, the debility surpassed that which the mere vomiting could have produced.

As a proof that inflammation and increased general action constitute, often, essential parts of the disease, may be mentioned the fact of the occurrence of abscess, and also such examples as the following outline may give. During the epidemic, a case occurred in which the left tonsil was tender and red; the left temple painful; the eye, on the same side, uneasy and inclined to water; the nose, not habitually apt to bleed, discharged a few drops of blood when blown, and this, continually, for four or five days; the pulse was excited. All these symptoms subsided at the same time, and, I doubt not, constituted a case, in its nature, the same as those which composed the epidemic, although there was no eruption. It was a state of excitement of the vascular system. My experience would induce me, therefore, to urge a caution against acting upon any general conclusion, that the disease is inflammatory in its nature, or, on the contrary, that it is one of mere debility. In the epidemic which is the subject of this paper, the predominant feature was debility, though not in all cases.

I would earnestly advise a careful attention to the circumstances of each case, and a proper consideration of the prevailing epidemic, in order to form the grounds of a correct conclusion for the guidance of the practitioner in the treatment of scarlatina.

Several rapidly fatal cases have led me to believe, that the principle of collapse which so remarkably accompanies and distinguishes the spasmodic cholera, has entered into the present epidemic. The spasmodic cholera which, I have already said, has shewn itself here, may be considered as having its own peculiar and fatal character appended to the well known disease, the cholera of this country; derived, probably, from some miasma or principle pervading the atmosphere. The following cases have inclined me to submit to other observers—whether they have thought the same miasma capable of modifying other diseases, believing, as I do, that it has, in fact, rendered more fatal, than usual, the scarlatina with sore throat, in the present epidemic. I select, as the origin of this suggestion.

Case I. —— Price, a young woman before spoken of, arrived at Beaconsfield, after a wet and laborious journey, and was received into the house of her sister, where three children were ill with scarlatina. Her case was clearly scarlatina, commencing on the fourth day after her arrival; the debility accompanying it was out of the usual proportion to the other symptoms. She was unable to rise in bed, and the attempt seemed to threaten immediate syncope. The inflammation of the throat was accompanied with a hoarseness; but the use of either general or local depletion was contra-indicated. She died on the fourth day of her illness; with but little sore throat, and clearly of collapse.

Case II. —— Buckland, aged 38, of drinking habits, was seized as with a common cold; the limbs and back aching, with much vomiting. On the

third day the eruption of scarlatina appeared on the chest; the throat was slightly inflamed; the arms were cold; the pulse scarcely perceptible; lips trembling; mind perfectly clear. On the same day the chest was covered with petechial spots; and death followed in the ensuing night. His debility, throughout, was that of collapse.

Case III.—Mr. ——, aged 53, of intemperate habits, as regards the use of spirits, was well on Sunday evening, Dec. 18, 1832. He read to his family at eight o'clock, went to bed at ten, and slept till twelve. He was then seized with a violent rigor; had great pain in the loins; and vomited every thing up which he took into his stomach. He had much head-ache. The rigor abated at four o'clock. Being questioned if his throat was sore, he declared it was not. At eleven a. m. the vomiting continued, with pain in the back. The throat was only slightly inflamed; the legs were red; the abdomen beginning to exhibit the rash of scarlatina; the intellect a little wavering; and the debility rapidly increasing. The case became unequivocally scarlatina, in the opinion of Doctor Rumsey and my son, as well as myself. He expired in the twenty-third hour from the attack.

Case IV.—Charlotte Trip, a fine active girl of 17, residing in a cottage adjoining one in which were two boys ill of scarlatina, was seized on Tuesday, January the 3rd, 1833, with vomiting, head-ache, and sore throat. The fluid thrown up was transparent mucus, with such articles as had been swallowed; on one occasion it was tinged with green bile. She had several motions, (which I did not see)

compelling her to rise suddenly. Her pulse was feeble, the intellect wavering, and the eruption of scarlatina covering the chest and face. The vomiting had very little intermission for forty-eight hours. The rash disappeared during a few hours of great depression of strength, and reappeared upon a temporary rallying. The arms were livid, and the extremities cold. The throat was sufficiently affected to confirm the character of the case. The debility was that of collapse. She died in about seventy hours after the attack.

Case v. —— Smith, a delicate girl about 7 years old, living three or four doors from Charlotte Trip, had recovered recently from mild scarlatina, and was seized, the day after Trip, with vomiting and purging. At first the motions were twenty or thirty in twelve hours, slimy, small, coloured with fæcal matter; afterwards more copious, fluid, and transparent, like rice gruel, accompanied by ejection from the stomach of the same character. There was no livid hue of the skin; no collapse; no spasm. The vomiting and purging continued, with varying violence, from Wednesday till the following Tuesday. Opium with calomel, the creta mixture with opium and ammonia, and the compound kino powder, were exhibited She ultimately recovered.

The scarlatina is very generally ushered in by moderate sickness and vomiting, which may continue from two to twelve hours; but the continued vomiting and debility, in cases 3 and 4, and the tendency to collapse in them, and also in cases 1 and 2, were surely very remarkable, and distinguished them as specimens of the epidemic, having a cha-

racter not less alarming than the cholera itself. Case 5 exhibited a purging and vomiting not differing from those of that mysterious disease.

Whether, therefore, this epidemic may have been modified by the cholera principle, and be peculiarly an epidemic of debility or not, it at any rate is evident that scarlatina is so far susceptible of such peculiar modification.

Scarlatina has continued, varying in the frequency of cases, through the whole of 1833; and, even to this time, has started up occasionally, when propagated by contagion; though there being now, probably, no epidemic principle to favour it, it is often limited to a single house, and has lost its alarming character.

I would just beg to recapitulate two particulars which have afforded me a striking lesson in this epidemic, and which I would press on the attention of the reader, as they point out that the mind of the practitioner should be kept free from prepossession as to the indication of cure in this disease, till a careful discrimination of its tendency be made. I would enforce the consideration, that the fact of its being scarlatina should be regarded only as the announcement of illness, whose true nature the physician is afterwards to make himself acquainted with; and that although the general character of any epidemic scarlatina may be debility, it will exhibit exceptions; and, vice versa—that although the generality of cases may be inflammatory, a solitary and occasional occurrence of the opposite character will be scattered amongst them, and a few patients will be cut off as with the sword.

All, then, who revere the obligations of conscience, who estimate rightly the value of life, and respect the feelings of friends sympathising with the sick and dying, should never loose sight of these facts. It is not less important, that the other particular should be dwelt upon, viz. the great mortality that may attend the secondary affection; referable to careless exposure, from a too early confidence that all has passed by. When children have passed through the disease, and carry about them little or no morbid character, the indulgent and the ignorant parents are alike apt to fall into a fatal confidence in their perfect security.

I am sensible that the preceding is a very imperfect sketch of this epidemic, its morbid phenomena, and treatment; and I regret the want of time and diligence, which has prevented me from making it a more perfect and useful history of the disease.

OBSERVATIONS

ON SOME OF THE CAUSES WHICH INFLUENCE THE

FORMATION OF GOOD OR BAD STUMPS,

IN CERTAIN CASES OF

AMPUTATION OF THE THIGH.

BY J. H. JAMES, ESQ.

Surgeon to the Devon and Exeter Hospital.

"THE frequent occasions requiring the performance of amputation of the limbs, and the simplicity of the object of this operation, ought to have brought it, long since, to the highest degree of perfection; but it often happens that the things which are most familiar to us, are those which least fix our attention." This remark, made long since, by a great surgeon,* is still but too well founded, although the reproach it contains cannot be deemed altogether just in the present day, as a great degree of attention *has* been bestowed upon this part of surgery, from that age to the present; and we see that this subject has very lately been much considered by many eminent men.† The following observation of another dis-

* M. Louis, Mem. de l'Acad. vol. v. 12mo. p. 277.

† Dupuytren, Guthrie, C. Bell, C. Hutchison, Hammick, Mayo, Larrey, &c. &c.

tinguished writer is, however, in my belief, still applicable: "In the operations of surgery there are a number of little circumstances, several of which seem, at first view, to be of no great consequence; but when their observation or neglect comes to be attended to in practice, they are found to contribute considerably to a speedy or tedious cure; to bring on, or prevent, bad symptoms; to keep the patient easy, and preserve him, or put him in pain, and bring him into danger."* At all events, it is still a well grounded complaint, that defective or projecting stumps are not unfrequent;† and it is my object, in the present paper, to solicit attention to some of the causes of these defects, (at least, so they appear to me) and to the best means of obviating them.

I do not mean to discuss the general principles which have been laid down, by authorities, for the performance of amputation in the thigh; but I cannot help remarking, in this place, how much the precepts and practice of modern surgeons differ even on this head. Thus, some recommend the plan of retracting the integuments from the muscles, after the first incision,‡ (or, if necessary, of reflecting them in some cases); others condemn this proceeding altogether;§ some divide the loose muscles first, and then the deep ones;‖ others divide the

* Monro, Ed. Ess. vol. iv. p. 257, on Amputation.

† "After amputation of the thigh, the surgeon is often disappointed at finding that, careful as he may have been to guard against this particular evil, the bone projects."—Mayo, in Med. Quart. Rev. July, 1834, p. 411.

‡ Guthrie, Allan, Sir A. Cooper, &c. &c. &c.

§ Sir S. Hammick.

‖ Hey, S. Cooper, Louis, Hutchison, &c. &c. &c.

whole at once;* some divide the skin together with the loose muscles by a first incision, and then those which adhere to the bone.† A large number of the best surgeons advocate the propriety of baring the bone to some distance, after having made the section of the deeper layer,‡ (a practice revived and strongly recommended by M. Louis) but which has also been condemned.§ Some employ Alanson's mode occasionally; and I may further mention, that, very lately, an eminent surgeon in France,‖ and another in this country,¶ have each adopted peculiar modes of operating. Again, the circular and flap operations have their several advocates, and

* Larry, Allan, C. Bell.

† Boyer.

‡ M. Louis, Guthrie, Hennen, Hutchison, Boyer, Allan, Larry, Monro, Dupuytren.

§ Sir C. Bell.

‖ M. Dupuytren's method of operating is thus described. "Le Professeur incise d'un seul coup, la peau et les muscles jusqu' aux os le plus souvent perpendiculairement a leur epaisseur quelquefois obliquement, comme pratiquait Alanson. La retraction operée par l'aide qui embrasse le membre au-dessus de la plaie, et la contraction des muscles donnent instantanément à la plaie la forme d'un cone saillant. C'est à la base de ce cone, c'est a dire au niveau de la peau relevée et des muscles retractes, qu'il port de nouveau l' instrument tranchant et separe tout ce que fait saillie. En faisant ainsi relever les chairs a mesure qu'il divise et en coupant successivement celles qui restent saillantes, il peut denuder l'os jusqu' à une hauteur de plus de six pouces."—Leçons Orales, t. iv. p. 298.

¶ Sir C. Bell (as stated, in the Medical Gazette of Oct. 18th, 1834,) while he condemns the plan of separating the muscles from the bone, and dividing the loose muscles, and those deep seated, by successive incisions, proposes, as a substitute, the plan of allowing the muscles some interval to contract, after their division (as M. Louis did) before the bone is sawed; and, also, of raising the limb "till the Femur comes into a perpendicular position," when the muscles will be found fully retracted, "and a large portion of the bone exposed," the bone is then to be sawed horizontally.

either may be preferable in particular instances. It is the operation by circular incision, however, to which I solicit attention ; an operation well adapted to a great number of cases, and which, if properly performed, will answer every useful purpose; but if badly executed, or if any cause interferes to prevent the kindly healing of the stump, often becomes a source of great pain and inconvenience to the patient during the remainder of life.

It may be briefly stated, that the object is to save sufficient muscle to cover the bone, and sufficient integument to cover both: the quantity of each being determined by the diameter of the limb at the point where the bone is proposed to be sawed.

Stumps may prove faulty, either from an original defect in the operation, which may generally be avoided by attention on the part of the surgeon ; or by the subsequent processes, over which he also often can exert a great degree of controul, but which will, in many cases, baffle even the best care and skill.

The first class of causes, then, which may produce bad stumps, are defects in the operation : and here I have to remark that, however copious may be the directions given by the most approved authors, on the subject of amputation, they chiefly contemplate either a healthy condition of the limb ; or such changes as are wrought by the immediate effects of simple inflammation consequent on injuries ; or emaciation. There are, however, *other* changes to which limbs requiring amputation are subject, which may deserve a little investigation, and induce us to vary our modes of procedure, according to circum-

stances. Even with respect to healthy limbs, some observations may not be amiss.

The general principles have just been stated: the muscles ought to meet over the bone, and the integuments over the muscles; the object is to know how this may be best accomplished, indeed, why not always attained. The necessary quantity of integuments, as Mr. Hey has stated, may be ascertained by admeasurement,* (a practised eye will rarely require it); but with respect to the other constituents, the muscle and bone, the quantity is not so easily determined. The proportion of the former saved may vary, both on account of its natural bulk at the part, which is less as we approach the knee, and also on account of the degree of contractility of the loose muscles, which will differ according to their condition at the time,† and will be more or less affected by the application of a tourniquet, or other circular band. The proportionate diameter of the bone to other parts in the section, it is important to observe, will also differ materially: thus, its diameter considerably increases towards the knee, while that of the muscular flesh diminishes in the same ratio. The converse is true as we approach the middle of the thigh; and hence it sometimes happens, with regard to amputation in the latter situation, that while the small extremity of bone is well covered with muscle, the surgeon may not have allowed sufficiently for the diameter of the limb at this point, so much exceeding that at the

* P. 527.

† Thus, as M. Louis observes, in a limb recently shattered they are stunned, and indisposed to contract; in one lately inflamed, they are, to a certain degree, glued together.—P. 527.

usual place, and if so, the integuments will be scanty,* an evil always obviated by attention. It is not so if the section of the bone be made too near the knee; an error to which the directions of some approved authors would lead,† or if the bone, at the lower part of the limb, be enlarged, or the muscles wasted by disease, as hereafter particularly stated; for in these various cases, although we may easily preserve an ample covering of integument, we shall fail in getting a cushion of muscle for the broad bone, unless we clear up the muscle from it to a considerable distance before sawing, a proceeding from which we shall reap this further advantage—that the section of bone will be made where the shaft is smaller.

I shall, in the next place, proceed briefly to consider those deviations from the healthy condition of the tissues of the limb, which are capable of affecting the formation of a good stump.

First.—The skin may be loose and redundant. This is commonly the case in old people; and if too much is saved in them, or from inadvertence it be so in any other case, two evils will result: one which has been sufficiently dwelt on, namely, the facility which will be thereby offered to the collec-

* This error may be owing, in part, to the loose way in which many authors have laid down directions for the operation, stating that *so many inches* of integuments are to be saved. This, of course, supposes that the limb is to be severed at the usual place, and that it is of the ordinary size: any deviation from these conditions will obviously affect such rules.

† Some recommend, in general terms, the limb to be removed as near the knee as possible.—Richerand, t. iv. p. 463; Boyer, t. xi. p. 147; &c. &c.

tion of matter; another, which has not been equally so, i. e. that as in closing the stump we act upon the muscles by drawing down the integuments, we are deprived of this advantage when the latter are superabundant, and the muscles consequently will not meet over the bone, or if we persist in thus forcing them down, the integuments will form a loose pouch over its extremities, as just stated. The goodness of the stump, in all cases, will much depend upon saving the exact proportion of integument. The plan which has been recommended by some authors, of dividing the integuments (previously drawn up) together with the loose muscles, by the first incision, is probably well adapted to these cases.

Secondly.—When there is an excess of fat in the integument, it not unfrequently happens that the adipose substance is so abundant and hard, that when we endeavour to close the wound, this unmanageable part will protrude, and we can by no means bring the edges together. During the process of suppuration, this will often disappear; but if we suspect its existence before the operation, it might not be amiss to incline the edge of the knife a little upwards in making the first incision.

While upon this point, I may remark, that we are sometimes compelled to operate upon limbs in an anasarcous state; should this be the case in any considerable degree, it is not a bad plan to roll the limb firmly before the operation, but even then, it is hardly possible completely to empty the cells, and there will be a drain of serum from the edges at first, which, however, if matters go on well, will

soon subside. In these cases it is not safe to trust to the tourniquet.

Thirdly.—The muscular flesh of the limb may be much changed in various ways: it may be simply emaciated; or it may be swoln and agglutinated, either from acute or chronic inflammation. In the first case, a good stump will hardly be formed, unless the bone is cleared high up; in the second, from want of contractility of the muscles, a similar proceeding will be essential; but it is to another degeneration that I now particularly solicit attention, in which, from long disuse, (the consequence of old-established disease in the knee or leg) scarcely any trace of muscle is left in the lower part of the limb; the fibre has been for the most part absorbed, and either we find mere fat in large quantity, or intermixed with a little fibre; or, what is not uncommon, the muscle converted into a sort of firm gristly semi-adipose matter, perfectly incapable of contracting under the knife.* Now, in such cases as these, I cannot but suspect that either of the methods practised by M. Dupuytren, or Sir C. Bell, or those of many other surgeons would fail; they are all based upon the principle that the muscles contract as they are divided, which is not at all the case here; the only mode of forming a good stump, I apprehend in these cases, is by clearing and sawing the bone high.

* April 20th, 1833, I amputated the thigh of a man who, three years before, had received a compound fracture of the leg, which had so entirely disabled it, as made him determine on having it removed.

There was no retraction of the integuments, or contraction of any muscular fibre. With the exception of two small portions of muscular flesh, the whole substance was converted into a dense fatty matter. On examining the severed limb, the tendon of the rectus was found close on the thigh bone, to which it adhered, without any muscular flesh beneath it whatever.

The muscles may not have degenerated, but another change may have taken place in them, depending upon a long continued position of the limb; thus, where the knee has been for a considerable period fixed in a bent position, the flexors will have their distal points already much approximated, and will not shorten in any great degree after they are divided; while the extensor muscles, which have been in the same proportion on the stretch, will retract much more; if, therefore, both are divided in the same plane, the latter will be deficient, the former projecting. The separate division, at different heights, of these two classes of muscle, will enable us to overcome this defect; and the position of the limb, after the operation, may be so regulated as to give an advantage to the defective portion.

Fourthly.—It not unfrequently happens that the state of the bone makes an essential difference in the operation. When we are obliged to amputate for necrosis of the thigh (affecting the knee joint, as it often does) it not unfrequently happens that we are obliged to divide the bone where, with the swoln periosteum, and the adjacent hard cellular tissues, it has a much larger bulk than common; the muscles around being at the same time much agglutinated. In these cases I must express my belief that it is most essentially necessary to save an ample quantity of integuments as our only sure resource for covering the bone; we may, or may not succeed in the progress of the operation, in preserving muscle enough, but of integument we are secure, and although it is not the best material, yet

it is infinitely better to protect the bone with this, than to leave it in any degree bare, which will inevitably produce a multitude of evils. If we can save the integument without detaching it from the subjacent muscles (a plan much condemned by many authors) so much the better, but if not, the knife must be used.

I have now, very briefly, stated some of those deviations from the normal state of the integuments, muscles, and bone, which materially affect the formation and progress of a good stump; I may be permitted to add, that a careful consideration of the condition of the limb, and the nature of the disease, before the operation, will often enable us to ascertain what we may expect, and to form our plans accordingly.

The state of the *integuments,* as to looseness, or the reverse; as to thickness, or anasarca; may easily be determined by pinching them up, or rolling them, or other mode of examination. The thickness of the *bone* may often readily be felt, and in cases of necrosis it is very important it should be. The size of the *muscular portion* may be presumed, from a comparison of the limb with the other; its condition, from the degree of rigidity, perhaps, I should say, mobility, or otherwise, under the integuments; from the power of distinguishing the bone beneath it, more or less readily; from the nature and duration of the disease; the position of the limb; and other concurrent circumstances.

The general conclusion is, that whenever we are likely to meet with bone of large relative diameter,

we must be sure to save sufficient integument; and if the muscular portion is deficient in quantity or contractility, it is very important to clear it up high from the bone; for which purpose I will further take leave to observe, that a good retractor is one of the most important *instruments* required for amputation.

It is not only at the time of operating, that a knowledge of the different changes the limb has undergone, may prove useful, the subsequent progress of the stump will also be materially affected by them; a point little dwelt upon in works on this subject: but there is no surgeon, accustomed to these operations, but must have observed that, independently of inflammation, or any accidental occurrence, some stumps, originally good, turn out the reverse; others, originally bad, improve very greatly: upon what these changes depend, it may be worth while to enquire.

There can be no doubt that a high degree of inflammation, occurring after amputation, will, directly or indirectly, ruin any stump; partly by the disorganization it produces; partly by irritating the muscles to constant contraction; partly by compelling us to give up the circular roller, upon which so much depends: however, these points of surgery have been so fully handled, that it is unnecessary for me to dwell upon them. The evil consequences of redundancy or deficiency of integument, have also been fully pointed out; but in connexion with this subject, it may not be amiss to observe, that there seems to be, in all cases of amputation, a disposition in the skin to relax or contract; the latter,

if irritated; the former, if soothed. By soothing, a good covering is sometimes obtained, although there may have been a deficiency in the first instance; while, by irritating, a good stump is often spoilt. When this relaxing process does not take place kindly, it may be advantageously solicited by fomentations or poultices to the face of the stump, often without giving up the steady pressure of the roller above.

The condition of the muscular flesh will also produce a great influence on the progress of the stump; if that has been merely and simply emaciated, it is not at all uncommon to see it plump up after the operation, and, in consequence, a better cushion is, in many cases, afforded to cover the bone, than might have been at first expected; but, on the other hand, it not unfrequently happens that the integuments, which at the time of the operation met easily, become separated by a considerable interval, in consequence of this enlargement of the muscular flesh.* If, in these cases, both muscle and skin are early united over the bone, the stump will be much better than it promised to be at first, for the muscle will fill out, and the skin elongate; but if the union is long protracted, the edges of the integuments will be separated by the enlargement of the muscular flesh, and the stump prove defective. The reverse of this is the case when, before amputation, the size of the muscular portion has been augmented, either by recent

* Considerable inflammation supervening will produce a similar effect in separating the edges of the skin, but this may be only temporary.

inflammation,* or where it consists largely of that semi-adipose structure which has just been described, both of which will waste during the suppurative process. Should the integuments have been at all deficient at the time of the operation, they will become slack and easy; and in this respect an important improvement will take place, provided it is only the parts subjacent to the integuments which are constituted by false flesh, if I may so express myself; but if the integuments are also anasarcous, or loaded with gelatinous effusion, they will likewise waste. In all these cases a perfectly plump stump will not be formed, unless the bone be cleared high up.

I have but one more remark to make on this subject, namely, that when the soft parts are deficient, and the bone prominent on the face of the stump, forcible attempts are often made to bring the integuments together by adhesive straps; these endeavours commonly fail, and are, indeed, mischievous, for if the straps are brought over the surface of the bone, then they bind down this thin and irritable covering upon a hard surface, which is sure to indispose them to unite or do well; and if applied at the sides, although they may bring the edges together, yet they will force the soft parts still more back from the bone.† The only remedy

* This may be easily ascertained by a comparison of the size of the two limbs. The increase often depends little upon any augmented thickness of the integuments, originating rather in the inter-muscular cellular substance.

† Monro makes a similar remark, but with reference to a different point, namely, the mode of suppressing hœmorrhage by the application of bandages on the face of the stump.—Ed. Ess. vol. iv. p. 270.

for such stumps, is to be found in good rolling, and proper position; or, these failing, in sawing off the bone higher.

There is another point which may, while upon the subject of amputation, be deserving of some attention, with relation to the frequent fatality of this operation. In considering the question, it is necessary to advert to the nature of this particular wound, which not only involves the ordinary soft parts, but also bone; and if the matter be viewed in this light, we shall perhaps perceive little difference between the wound resulting from an amputation and that of a compound fracture. It is true that, in the stump, we ought to have no laceration of the soft parts, but, on the other hand, they are often in a very unhealthy condition. It is also true, that we have no spiculæ of bone to produce irritation; and although the injury done to that part, by the saw, is very great, yet it is much more limited in extent than in fracture. I apprehend, however, that the formidable results often consequent on this operation, if the wound passes into any considerable degree of inflammation, may be much explained by the obvious analogy with the accident alluded to above; hence, as in compound fracture, the case often does worse if the surgeon persists in his endeavours to keep the wound closed,* (the first attempt at union

* M. Dupuytren unites the stump, in cases of amputation from accident; but adopts a different mode of practice in those cases which are rendered necessary by disease.—Leçons Orales, t. iv. p. 415, et seq. —The reason he assigns for this difference, is deduced from the greater mortality which he has observed follow the practice of immediate union, in the latter description of cases; the cause of this he imputes,

being defeated) than if he throws it open; hence the severe constitutional irritation, the disposition to phlebitis, &c. Either injury is liable to causes of aggravation peculiar to itself: in the compound fracture, every motion disturbs the process of ossific union essential to the cure, and may cause the shattered bone to irritate the soft parts; in the stump, this is not the case, but then each movement may displace the loose muscles, ready to shrink up, and destroy the recent adhesions. In the compound fracture, it is the confining and collecting of matter which produces the worst symptoms; the same thing will happen in stumps, if early care is not taken to give it vent: our true advantage in amputation is, that we can, if we choose, always effect this, while in compound fracture we often cannot.

There is one circumstance which strongly evinces the similarity of the process, in cases of bone divided by the saw, and those where it is fractured, namely, that in many amputations much osseous matter, or matter approaching to it, is deposited about the end of the bone, which is often, but not always, reabsorbed; this will, I believe, frequently engage the extremities of the nerves, and so occasion much inconvenience in that, as well as in other ways; indeed, I cannot help thinking, that the consequences accruing to the nerves may have been, possibly, too exclusively attributed to diseased thickening originating in the nerves themselves, for in these cases we observe that, from the position of the

chiefly, to the sudden cessation of the suppurative action: but is this the only cause? Is it not an occasional one only; and when it does apply, not, perhaps, the principal cause?

wound, the nerves being turned in upon the divided surface of the bone, together with the other soft parts, while that bone pours forth its peculiar effusion in common with them; they thus become entangled in a matter dense and unyielding, into which, moreover, they are pressed by the straps and bandages applied, and hence peculiar causes of irritation are afforded. In other wounds, whatever their nature may be, it is comparatively rare to find such consequences ensue to the nerves.

This deposit of osseous matter more particularly attracts the attention of the surgeon, as the soft parts are healing, and it is accompanied with the same kind of increased action, which is not uncommon in fracture, whether complicated with a wound or not. Similar measures are beneficial in both cases, namely, leeches, and evaporating lotions or poultices, to the immediate seat of this action, which is denoted by pain, heat, and *solid* swelling; and blisters applied more remotely.

In conclusion, I beg very briefly to state, that I have been induced to offer to the consideration of the Profession, the preceding observations on these minor points connected with the important subject of amputation, because it appears to me, as far as I have been able to enquire, that many of them have very much escaped, and some altogether, the notice of writers on this subject; and yet I cannot consider them to be wholly undeserving of attention.

A CASE OF

EXTRA-UTERINE FŒTATION,

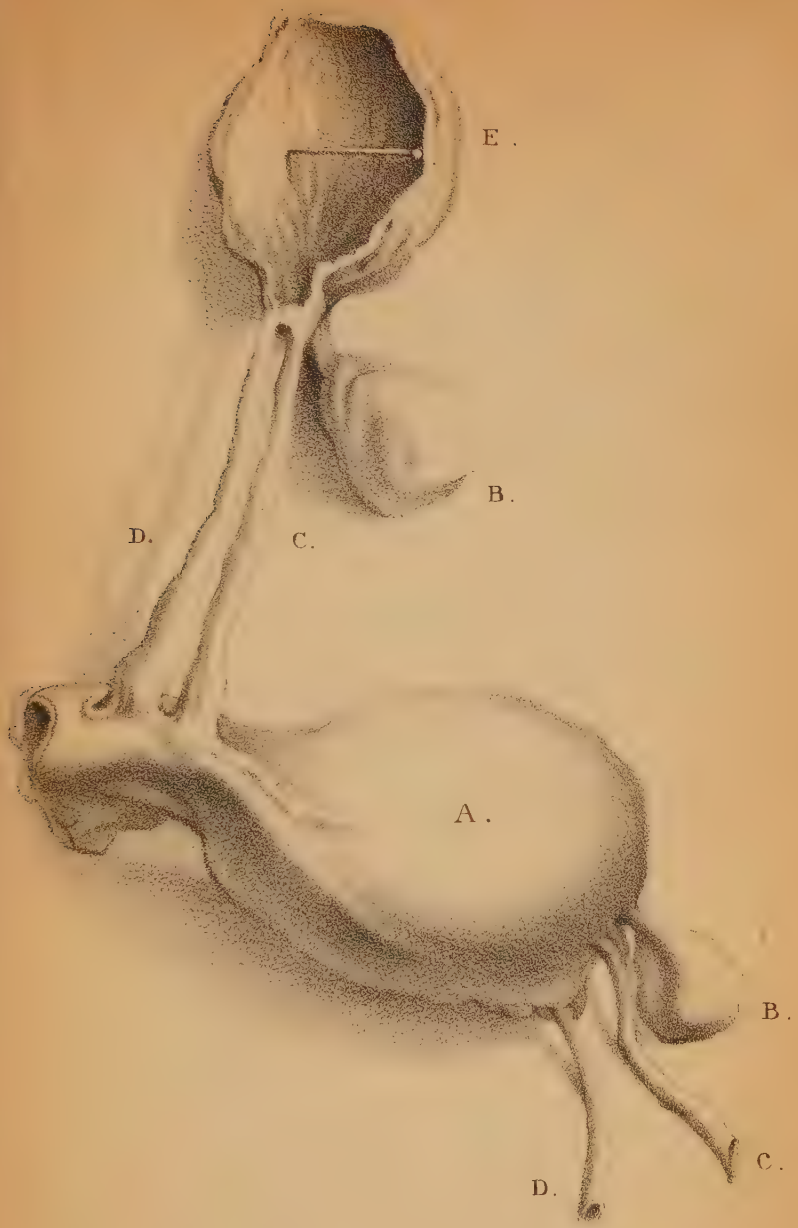
WITH REMARKS.

BY CONGREVE SELWYN, ESQ.

Surgeon to the Ledbury Dispensary.

Early on the morning of the 16th of May, 1834, I was sent for, in haste, to see Amelia Goode, aged 28, residing at Berrow, in Worcestershire. I found her faint and low, with a pale anxious countenance, and complaining of very severe pain over the whole of the abdominal region. Her agony was much increased by pressure; as likewise by any movement of the trunk, or extension of the lower extremities. She complained of thirst, but there was no sickness. Her pulse beat 120 in the minute, being extremely weak and irritable.

I learnt from her nurse, that on the day previous, immediately after eating a hearty dinner of cold pudding, &c. she was attacked with severe vomiting and purging, which continued about half an hour; and that feeling very faint, she retired to bed. After two or three hours' rest she came down to tea, apparently as well as usual, but was seized directly afterwards with a great sense of fainting, and pain in the bowels. This obliged her to go to bed again,



Mr. SELWYN'S CASE OF EXTRA-UTERINE FŒTATION.

Ducôté and Stephen's Lithography 70, St. Martins Lane, London.

when she was bled by a woman in the neighbourhood, and her friends sent for me. I had delivered her of a living child, in October, 1831, and she believed herself to be now two or three months advanced in pregnancy. The symptoms clearly denoted that the constitution was labouring under some severe shock, but as to the exact nature of it, I confess, I felt very much in doubt. However, from the pain experienced on pressure, &c. I concluded there was peritonitis, and accordingly bled her. The pulse did not improve as the blood flowed: I, therefore, ordered local depletion, with calomel and opium. But all was fruitless. The pain continued to increase; the surface became colder; the countenance more collapsed; and she died at six o'clock in the evening, having retained complete consciousness to the last.

About forty hours after death, I examined the body, assisted by my partner, Mr. Miles Astman Wood. On making an incision into the abdomen, a quantity of blood began to escape, and, with a sponge, we removed between three and four pints of that fluid from the pelvic cavity. There was, also, a ronnd tumour, apparently of coagulated blood, lying in it; but on separating the external layers, a fœtus, about three months old, was seen within, floating in its liquor amnii. On examining the uterus, and its appendages, a large ruptured cavity was found (apparently, for I could not trace its canal) in the right fallopian tube, from which the fœtus had escaped. As a drawing will convey a more correct idea of the condition of the parts, than could be given in words, one is subjoined from

the pencil of Mr. Ballard, of Ledbury; which he was kind enough to draw, at my request. Neither the peritoneum, nor its enclosed parts, presented any marks of inflammation. The bowels, on the contrary, were particularly blanched.

As the case offers many points of interest, I hope I shall be excused if I make a few remarks on it. First: Did the vomiting, on the evening of the 15th, produce the rupture, or was this the cause of the sudden sickness? From careful reflection, I am inclined to think that the former was the cause, as it came on immediately after eating a hearty indigestible meal; was preceded by no excessive pain, or fainting; and was, moreover, accompanied by great relaxation of the bowels. Then, again, the mortal pain, and sinking, first began at least three hours after the commencement of the attack, and after drinking plentifully of warm tea. This, too, was attended with no vomiting or purging; neither did these symptoms subsequently recur. The edges of the ruptured cavity, also, were thick and abrupt, presenting rather the appearance of a sudden rupture, than that of a gradual thinning. It would seem, therefore, probable, that the severe vomiting occasioned a slight rupture of the fœtal sac, with partial hæmorrhage, giving rise to the first fainting; and that this was subsequently extended, by the exertion of walking down stairs, and taking a considerable quantity of warm tea. Could the unnatural situation of the right fallopian tube and ovary, have had any thing to do with the cause of the extra-uterine fœtation? It is impossible to say. I should think not, as the fecundated ovum, one

would suppose, might as readily pass into the uterus, in this situation of the duct, as in the normal one. However it may be, this case proves, like many others, that impregnation does not take place in the uterus, but that the male semen traverses the fallopian tubes; though by what means we are at a loss to determine. Like many other facts in the animal economy, this eludes our view, and baffles the skill of our deepest conjectures.

EXPLANATION OF THE PLATE.

a. Uterus. *b. b.* Ovaria. *c. c.* Tubæ fallopianæ. *d. d.* Ligamenta rotunda. *e.* Ruptured cavity which contained the fœtus.

OBSERVATIONS ON PTERYGIUM.

BY RICHARD MIDDLEMORE, ESQ.

One of the Medical Officers of the Birmingham Eye Infirmary, Lecturer on Diseases of the Eye, &c.

PTERYGIUM is a morbid growth of a triangular figure, generally commencing at the inner canthus of the eye, at that part of the conjunctiva immediately around the semilunar fold and lachrymal caruncle, its point or smaller extremity being situated towards or upon the cornea, and its base directed towards the periphery of the eye-ball.

In systematic works on ophthalmology (Frick, Travers, Guthrie, Laurence, Mackenzie,) pterygium is usually classed among the chronic diseases of the conjunctiva, and very properly so, inasmuch as it always commences in that membrane, or in the cellular texture immediately beneath it, and only implicates the cornea, or rather the outer membrane of the cornea, by an extension of morbid action.

I have stated that pterygium most commonly arises from the inner canthus, but it may be situated at the temporal side of the eye-ball, or at the upper or lower part of the globe; and instances are not wanting in which pterygium has formed in all these situations at the same time, so that the points of the four pterygia have met upon the cornea, and completely obscured the pupil. When, however,

there exists only one pterygium, its more ordinary situation is towards the inner canthus; but it is by no means an infrequent occurrence to witness two pterygia upon one eye, one arising from the inner, and the other situated at the outer canthus. Perhaps I may be allowed to state upon this subject, as the result of my own experience, that the frequency with which pterygium occurs, as respects the various parts of the eye, takes place in the following order: first—the formation of a pterygium upon each eye, arising from the inner canthus; secondly—the occurrence of two pterygia upon one eye, one arising at the inner, and the other at the outer, canthus; thirdly—the formation of one pterygium alone, either at the outer canthus, or at the upper or lower part of the eye-ball, but not at the inner canthus. The occurrence of four pterygia upon one eye, the points of which have met upon the cornea and completely obscured the pupil, constitutes, in the opinion of the celebrated Scarpa, the pannus of the ancients. I have only witnessed one case, and that very recently, in the eye of Joseph Burley, a patient now under my care at the infirmary.

Notwithstanding this statement of Scarpa, it will be found, on referring to *many* of the older writers, that they made a tolerably correct distinction between pannus and pterygium, as these diseases are respectively defined at the present day. I believe this assertion, as a general one, will be found to be strictly accurate; but of course many exceptions occur; and Scarpa appears to have considered that to be the general rule which is merely the exception. Such, at least, is the conclusion at which I have

arrived, after having attentively perused (with particular reference to this not uninteresting enquiry) the works of many ancient writers on ophthalmic disease. I may, however, mention, that Ettmuller, whose "*opera omnia theoretica et practica, &c.*" was published in 1685, speaks of pannus as a variety of pterygium: he says, when mentioning *unguis,* which term he uses as being synonymous with *pterygium,* "*tunica hæc non semper uniformis existit, nunc plana tenuis et albida esse solet at propriè tunica appellatur et unguicula. Interdum est* carnosior *et tunc dicitur* pannus." The terms *pannus* and *panniculus* were applied, by Banister, (who published in 1622) to a condition of disease we should now term *pterygium carnosum.* And the learned and laborious Heister, whose large work on surgery appeared more than a century ago, treats "*de ungula, unque,* panno sive pterygio *oculorum,*" as though the distinct diseases comprehended under that title, were one and the same.

I have mentioned that pterygium generally forms at the inner or the outer canthus of the eye, and it was formerly pretty generally believed to have its origin from the lachrymal caruncle. The following definition of pterygium, by the learned Sauvages, implies its origin from the canthi of the eye. "*Est,*" says he, *excrescentia cornea vel membranaceo-vasculosa ad oculi canthum exorta, alam expansam referens, et versus corneam se extendens.*"—(Tom. 1, p. 156.) And Wenzel, in his "*Dictionnaire ophthalmologique,*" defines pterygium to be an "*excroissance particulière et charnue dans les angles des yeux.*" —(63.) So, also, Linnæus speaks of pterygium as

a "*cuticula excrescens e cantho oculi;*" and the definition of Sagar is partly founded on the mere circumstance of situation, or, to use his own words, pterygium is an "*excescentia plana in oculi cantho.*"

The form of pterygium is always more or less triangular; but it does not form a perfect triangle, for the point situated towards, or upon, the cornea, is generally rounded, and more or less obtuse; and the edges or lines proceeding on each side, from its base to its apex, and constituting the lateral outline of the pterygium, are slightly inclined towards its centre, so as to present a slight concavity on each margin. Now the cause of this triangular form has been well explained by Scarpa, who first pointed out the true reason why pterygium assumes—invariably assumes—this particular figure. He says, "the constancy of this fact (the triangular figure of pterygium) ought to be referred to the adhesion of the lamina of the conjunctiva becoming stronger as it advances from the centre towards the circumference of the cornea;" and he adduces the progress of the disease, in decisive support of his assertion. The increasing strictness of the union subsisting between the conjunctiva and sclerotica, in proportion as those parts approach the margin of the cornea, is indisputably true; and, certainly, no laboured train of argument can be required to prove what is so capable of direct anatomical demonstration; but, as the form and rate of progress of pterygium depend, in a great measure, on the same cause, I shall proceed to describe the various stages of pterygium, from its origin to its complete development, in order that the details of my subject may be the more fully and methodically discussed.

The first appearance of pterygium is indicated by a few enlarged conjunctival vessels, proceeding from the inner canthus, (I will assume that to be its situation, for my present purpose) and running in a direction nearly parallel to each other; at the same time, there is an appearance of increased thickness in the conjunctiva, just as though a fine web, or film, had been spread upon its surface In a short time, there is seen a small reddish deposition, situated at about two or three lines from the corneo-sclerotic junction, and the vessels proceeding to, and terminating in it, begin to assume a more definite and distinct arrangement; by very slow degrees this deposition near the cornea becomes more apparent, increases in size, and approaches nearer to the cornea, until it reaches the line of union between the cornea and sclerotica, where it is seen to project above the corneal margin. The vessels proceeding to it, and constituting part of its volume, now become more numerous—the texture in which they are placed increases in density and opacity—and its outline is rendered perfectly distinct by its elevation above the surrounding portion of conjunctiva; it is also quite moveable, and may be raised more or less extensively from the sclerotica, according as its connexion with the texture beneath may be merely *filamentous*, or by a greater extent of more intimately connected surface. At this stage the nature of the disease is rendered quite evident; there is, in short, a red triangular deposition beneath the conjunctiva, which is gradually acuminated towards the cornea, where it rises in a distinctly elevated projection around its margin.

The disease may remain for a long period in this situation, before it makes any discoverable progress upon the cornea; but, after a time, if no measures be employed to impede its growth, it continues its course, acquiring thickness and strength as it advances, until it appears like a triangular muscle, and may extend (gradually tapering as it proceeds) to the centre of the cornea, particularly if a similar pterygium be advancing from the opposite side, when its point is much finer than in those instances in which no opposing pterygium exists.

During the progress of a single pterygium upon the cornea, its base gradually increases in thickness and breadth, so that that part of the pterygium which was situated at the junction of the cornea and sclerotica when its size was small, and when it had not proceeded far upon the cornea, and which was then quite narrow, becomes broader as the disease advances, which is absolutely necessary to preserve the triangular shape of the morbid growth; for, if its breadth did not increase in that situation, as the disease became in other respects extended in length and augmented in breadth, there must either have been a stricture at that part, or it must have retained the same breadth to whatever extent it might afterwards proceed upon the cornea; or, to express myself with more precision, if the strictness of adhesion between the conjunctival covering of the cornea and its primitive layer had been alike—equally intimate—over its entire surface, and if that portion of pterygium, situated at the line of union between the cornea and sclerotica, possessed a given breadth when the disease had proceeded upon the

cornea for a short distance only, which breadth it had maintained without any variation when the disease had advanced to the centre of the cornea, the breadth of the pterygium must have been equal from the margin to the centre of the cornea. But, as the pterygium continues to retain the same triangular figure upon the cornea, as it possessed upon the sclerotica, it is right to presume that the same variations, as respects strictness of adhesion, take place between the conjunctival covering of the cornea and its primitive layer, from circumference to centre, as we have proved, by anatomical evidence, to exist between the conjunctiva and the sclerotica, from its first connexion with the latter membrane, at the periphery of the eye-ball, to its termination at the margin of the cornea.

Now, although the progress of pterygium varies somewhat in different individuals, and in different kinds of pterygium, there is, all other circumstances being equal, the same rate of progress maintained in all of them as regards their different stages; their growth being comparatively rapid prior to their approach to the margin of the cornea, stationary for a certain period when they arrive there, and much slower upon the cornea than upon the sclerotica.

Such is, I believe, a correct history of the common fleshy pterygium, and of the rate of progress of pterygia in general, in the various situations in which they may be placed; and these circumstances strongly tend to substantiate that statement which was originally made by Scarpa, with regard to the anatomical explanation he suggested in reference to the triangular figure pterygium always assumes.

It cannot be denied that the sclerotic conjunctiva is much more loosely connected to the sclerotica at the periphery of the eye-ball, than nearer to the cornea; and that the increasing strictness of adhesion which subsists between these parts, as they approach the margin of the cornea, takes place very gradually; and there is every reason to believe that the conjunctival covering of the cornea is much more intimately connected with that membrane in its centre, than at its circumference; in proof of which, I may mention the facility with which the mucous tunic of the cornea permits the enlargement of its vessels, or the extension of those which naturally terminate at the corneal margin, upon its circumference, forming what is termed vascularity of the cornea, and the extreme rareness with which these enlarged vessels extend to its centre. I may further allude to the extension of pterygium laterally, when it has reached the centre of the cornea, and is prevented, by the greater strictness of adhesion which exists between its conjunctival covering and primitive layer in this situation, from proceeding directly across that membrane; and, lastly, in further corroboration of the probable correctness of my previous statement, I may direct attention to the frequency with which phlyctenulæ, or pustules, form at, and towards, the circumference of the cornea rather than at its centre, by which the corneal conjunctiva is elevated from its primitive layer. However, it does appear to me, that this circumstance alone is scarcely adequate to produce the phenomenon in question; and I am of opinion, that although the triangular figure of pterygium is chiefly

determined by the increasing strictness of adhesion of the structures between which it is formed, as it recedes from its base—that is, as it approaches the circumference of the cornea—whereby the extension of disease laterally is more and more limited; yet the diminishing size of the vessels, (which have always a tendency to pass in a parallel direction with regard to each other) by lessening the nutritive supply, materially contributes to the production of this effect; for it is obvious that a growth of this nature must be increase or diminished in size, in accordance with the increase or diminution of its vascular supply, and that, consequently, as its vessels become smaller, the growth they support must also become smaller, until it approaches to a point, which, in fact, takes place in the case under consideration, and constitutes the apex or extremity of the pterygium; and this effect is the more probable, inasmuch as the nutrient vessels of a pterygium run in a parallel direction with respect to each other, and do not ramify so minutely and diffusely as do similar vessels in other situations.

I am well aware that the latter part of this statement is at variance with the views of Scarpa, who considers chronic varicose ophthalmia, nebula of the cornea, and pterygium, merely as degrees of the same affection; and believes the pterygium to be chiefly formed by, and composed of, varicose vessels; but I entirely agree with Mr. Guthrie, that the latter part of Scarpa's statement is by no means correct, and I found my opinion of its inaccuracy upon the following facts: and first, the order and well known effects of chronic ophthalmia are

widely different from pterygium; secondly, pterygium occurs much less frequently than it could do if it arose simply as a consequence of chronic ophthalmia; thirdly, the nebula of the cornea is quite distinct in its history, and dissimilar in its character and appearance, from pterygium; fourthly, pterygium frequently occurs in the eyes of persons who have not previously suffered from any form of ophthalmia whatever; and, besides, it must be remembered that its appearance is neither preceded by, nor its progress attended with, pain.

There are certain varieties of pterygium which it is necessary to describe; but as they are all formed on the same principle, fashioned to the same model, and placed in the same texture, I shall proceed to explain the mode in which they are developed, before pointing out those varieties, which, as regards their treatment, it is important to distinguish.

In the first place, there will be seen a thin semi-transparent layer immediately beneath the conjunctiva, in the subconjunctival cellular membrane, in which blood vessels are situated, which do not divide and ramify extensively, but pass onwards towards the cornea in a direction nearly parallel to each other; this deposition increases, until, in the worst cases, it becomes a thick red mass, having a triangular figure, a flattened surface, and fibrous aspect, much resembling a small muscle; the conjunctiva becomes raised and attenuated, so as to be expanded upon its front surface, and reflected on each side upon its posterior aspect, from which it is again reflected upon the globe of the eye, so that you may raise it entirely from the sclerotica on each side;

but in the middle of its under surface it is always adherent, more or less extensively—it is, in fact, adherent in consequence of the reflection of the conjunctiva on each side of its posterior surface to the globe of the eye. Hence it may be remarked, that a probe passed behind a common fleshy pterygium will enter a sort of *cul-de-sac*, and become obstructed at a point which will mark the line where the conjunctiva becomes reflected from the posterior aspect of the morbid production to the sclerotica.

From the preceding remarks, it will be perceived that the disease called pterygium, is developed, for the most part, in the subconjunctival cellular membrane, and is bounded (if I may be allowed the expression) in front by the conjunctiva, and behind by the sclerotica. I am most anxious to fix attention to this fact, for, unless there exist a perfectly correct and definite notion concerning the precise seat of the disease, it will be quite impossible to reconcile many of the explanations of the form and other characters of pterygia, which have been given in the course of these observations. If it be imagined that the morbid production we are now considering is, as Scarpa represents, a congeries of varicose vessels placed *upon* the conjunctiva, which has degenerated into a thick and opaque tunic, or if you believe that it is a growth *from the surface* of the conjunctiva, the anatomical explanation of its form, previously given, cannot be considered correct, inasmuch as the nature of the anatomical connexion subsisting between the conjunctiva and subjacent parts, can only influence its form, or determine its triangular figure, in the situation to

which I have alluded—that is, in the cellular texture intervening between the conjunctiva and the sclerotica.

Scarpa first explained the true cause of the triangular figure of pterygium; and anatomical investigations so strongly corroborate the probable correctness of his explanation, that, until some more plausible cause be offered, we are justified in pronouncing it to involve a fact of established accuracy; but, in reasoning upon the nature, or rather upon the positive and precise structure of the pterygium itself, he reiterates his belief that it is not a new production, but a *perversion* or *conversion* of a fine transparent membrane into an opaque and reddish-coloured tunic; and this opinion he entertains for the following reason: when the pterygium is removed from the cornea, that texture is denuded of its external covering. It is, indeed, quite true that, on the removal of a pterygium from the cornea, the surface beneath is denuded to a certain extent of its mucous covering; but it is by no means an established fact, that the pterygium is no new production, but a conversion of the conjunctiva into an opaque and reddish-coloured tunic; and if it were an established fact then, as I before mentioned, his anatomical explanation of the cause of the triangular form of pterygium, cannot be admitted.

I trust this part of my observations, which I am particularly desirous to explain, will be correctly understood, namely, that the notions of Scarpa, with regard to the *seat* of the morbid change, would induce a belief that pterygium consisted of an alteration *in and upon the structure of the conjunctiva*

itself; whilst his explanation of its *form* applies only to a growth, or deposition, taking place in the *subconjunctival cellular membrane,* which is, in fact, the true seat of pterygium. And with regard to the denuded state of the cornea on the removal of a pterygium, that is owing to the tardiness with which its conjunctival covering yields, and the small distance to which it is reflected upon its posterior surface to each side, compared with the extent to which the same occurrence takes place upon that part of it which is situated upon the sclerotica, which may be readily determined by passing a probe behind that portion of a pterygium situated upon the cornea, and that placed over the sclerotica; the distance to which the conjunctiva is reflected, in the former situation, will be found to be much less than in the latter; so that a portion of the cornea, nearly equal to half the breadth of the pterygium, is deprived of its conjunctival covering, when pterygium forms upon the cornea; whilst merely a small linear or horizontal slip of the sclerotica, corresponding to the centre of the posterior surface of the pterygium, throughout its whole length, as far as the cornea, is destitute of its conjunctival covering, when pterygium forms in the latter situation. If it is believed that the form of pterygium is determined by the anatomical peculiarity of the connexion subsisting between the conjunctiva and the subjacent parts, it must be also admitted that the morbid product, strictly so called, exists in the subconjunctival cellular membrane; for *in no other situation* could it exercise an influence sufficiently powerful to decide and determine its figure.

But it may be very justly said, that deposition in the subconjunctival cellular membrane, would, generally, have a tendency to become prominent, unless some counteracting power disposed it to assume a flattened aspect; and there are two circumstances in operation which determine this flattened aspect: first—the facility with which the conjunctiva may be slightly detached for a great extent, laterally, compared with the difficulty with which it may be considerably elevated at any one point; and, second—the pressure the deposited matter sustains from the palpebræ, either in their closed state, or deriving their movements upon the eye-ball; on which account, indeed, almost all growths from the conjunctiva, and growths and depositions within the subconjunctival cellular membrane, are flattened externally.

I should have mentioned, that pterygium generally occurs at, or beyond, the middle period of life; rarely in children; and still more rarely in infants. But Monteath, Wardrop, and others, have noticed it immediately, or very soon, after birth; so that they who are disposed to attribute its formation to chronic ophthalmia, or previous inflammatory disease of the eye, must admit that it may occasionally take place independenly of such a cause—I mean in the case of congenital pterygium; unless, indeed, it can be supposed that such inflammatory affections of the eye have occurred, and preceded its formation, during the period of uterine existence. As pterygium occurs without pain, and is frequently discovered, accidentally as it were, by the patient himself, we cannot admit that it arises from inflam-

mation, in the strict sense of that term; but, in making this statement, I must confess that it is not in my power to mention any cause adequate to its production; I am, in short, unacquained with any satisfactory account of the causes of pterygium, and am unwilling to occupy time by a mere recital of conjectures. Beer, whose experience must have been most extensive, believed that lime, or stone dust, gave rise to pterygium, inasmuch as he has noticed it in masons' labourers; but although I have often treated the eyes of this class of individuals for various diseases, I have no recollection of having seen one case of pterygium among them; their ordinary ophthalmic affections are—chronic ophthalmia; relaxation of the conjunctiva; thickening; opacity; and sometimes vascularity of the conjunctival covering of the cornea. Indeed, many of the cases of pterygium which I have seen, occurred in persons engaged in farming employment. I am aware that very singular notions are entertained by authors, respecting the causes of pterygium; and I may state that Banister, who wrote "A Treatise of one hundred and thirteen diseases of the Eyes and Eye-lids," more than two centuries ago, explains that this singular malady (pterygium), the varieties of which he clearly points out, may be had "by inheritence," and that it is also contagious; and it is even said to arise from metastasis, "passing from one eye to the other." I think I have observed it to occur, in one or two instances, as a consequence of a blow upon the eye.

The varieties of pterygium which are entitled to separate description, are these, namely: the mem-

branous, or *pterygium tenue*, which is merely a thin semitransparent layer, in which the course of the vessels may be distinctly observed;—2, the fleshy pterygium, or *pterygium carnosum*, which resembles, in outward appearance, the fibrous structure of a muscle;—3, the adipose pterygium, or *pterygium pingue*, which is chiefly of a white, soft texture, much resembling common fat. This latter variety of pterygium is, however, much less common than the two former.

Sometimes the true sarcomatous pterygium is so thick and strong, and its termination upon the cornea so particularly expanded, that it pretty closely resembles a muscle; and, as in the case related by Schmidt, it might almost be supposed that one of the straight muscles of the eye was displaced. Such a case very recently came under my care, and I performed an operation for its removal, more in compliance with the patient's wish, than from any sanguine expectation of affording him relief; and, as I apprehended, the cornea had become so much disorganized, that when the pterygium was removed from its surface, it was found to be opaque and vascular, and much thickened; and this, indeed, is generally the case when pterygium of the sarcomatous kind has existed for some time, and becomes, as it now and then will become, expanded upon the cornea so as to obscure the pupil. In the case to which I am referring, the pterygium resembled a strong triangular muscle (situated at the upper part of the eye-ball) which could be wholly raised from the sclerotica, except at its posterior part, where a central line of adhesion was discovered, extending

from its base to the margin of the cornea; *this line of adhesion was chiefly composed of a double fold of the conjunctiva, reflected on each side from the eye-ball to the posterior surface of the pterygium,* but it was much more firmly connected with the cornea. Its base was traced upwards, beneath the superior palpebra, as far as the *cul-de-sac* of the conjunctiva, and its opposite extremity, where it terminated upon the cornea, was rounded, obtuse, and in appearance, *though not in structure,* tendinous. I removed this pterygium, in the presence of my respected friend Mr. Hodgson, under the circumstances, and with the doubts respecting the utility of the operation, which have been already mentioned, and the result was, as I have explained—quite successless. Now this is an occurrence which young surgeons would be scarcely prepared to meet with, if they implicitly relied upon the authority of some ophthalmic writers, among whom I may mention Beer, Weller, Ware, Travers, and Mackenzie. Indeed, Mr. Mackenzie proceeds so far as to assert, that "when properly treated, no trace of the disease (pterygium) remains, neither over the sclerotica, nor on the cornea"—(197); an assertion which is quite at variance with my own experience; for. whenever a pterygium has proceeded far upon the cornea, and has remained there for a long time, the texture of that part of it upon which the pterygium was situated, has been invariably rendered opaque, and quite incapable of transmitting light; and this opinion, I perceive, coincides with the great experience of Scarpa and Sabatiér.

The settlement of this point is of material im-

portance, in determining the propriety of an operation; for, if my view of the subject be correct, then an early operation becomes imperatively necessary, with the intention of preventing those changes in the texture of the cornea which are apt to arise if the disease be allowed to remain; but, if my opinion be erroneous, then, of course, no such necessity for promptitude, in the application of the surgical remedy, can be requisite.

I have related the preceding case at some length, for it was from a careful inspection of this pterygium, that I was first enabled to ascertain that fact, with regard to the seat of pterygium in general, which I have, perhaps, explained with tedious minuteness. On elevating this pterygium with a forceps, for the purpose of removing it, I noticed that that part of the sclerotica from which I had raised it, was still covered with conjunctiva, and that a probe could be passed on each side as far as its point of reflection; and a close examination of the surface of the pterygium, left no reason to doubt that *it* was also covered by the conjunctiva, which was attenuated and expanded upon the *whole* of its *front surface*, and *nearly* upon the whole of its *posterior surface;* and the accuracy of the opinion I formed from an attentive examination of this case, has been fully corroborated by subsequent observation.

I have not alluded to the carcinomatous and malignant pterygium, as it is sometimes termed, because such cases have never presented themselves to my notice; and as pterygium is allowed to be a disease, the progress of which is unattended with pain, I am not inclined to admit the existence of

such a variety; although, of course, I do not mean to deny that almost any morbid product, however simple may be its characters at its commencement, may be rendered irritable or malignant by mischievous and injudicious interference.

I may remark, that in old cases of large sarcomatous pterygium, when the disease has arrived at the centre of the cornea, it spreads laterally, so as to acquire a very obtuse extremity, and that in this way it may obscure nearly the whole of the pupil, and destroy all useful vision. It does not proceed from the centre directly across the pupil; it does not progress in a direct and continued course; but covers the greater part of the cornea by its expansion laterally, when its direct progress has been arrested by its arrival at its centre, so that, eventually, nearly the whole of the cornea becomes concealed and obscured. I need scarcely remark, that this fact affords an additional proof of the accuracy of those views of Scarpa, to which, in the course of these observations, I have so frequently adverted.

Prognosis.—The prognosis of pterygium, of whatever kind, is favourable so long as it does not extend so far upon the cornea as to interfere, in any material degree, with the vision; but if it spread out upon the cornea, or if it extend so far as to destroy vision, and has been permitted to remain for a long period, the cornea will very probably have sustained those changes which will have impaired or destroyed its transparency; and these observations will equally apply, whether one or more pterygia exist, and whatever may be their

situation; except that one situated at the lower part of the eye is likely to produce more interruption to vision, *cæteris paribus,* than one placed at its lateral or upper part.

Of course, if pterygium be allowed to exist for a long period, its connexion with the subjacent parts becomes more and more intimate. At first it may be, and generally is, very loosely and slightly connected with them; but in the course of time it becomes, as it were, identified with them—its stability of organization is increased—its intimacy of adhesion augmented—and, in short, it eventually becomes almost identified with the parts beneath; and hence the apparent disorganization of the cornea, when old sarcomatous pterygia are excised from its surface.

Diagnosis.—Pterygium is easily distinguished from other depositions in the subconjunctival cellular membrane, and from growths from the conjunctiva, by its form, its general appearance, and the laxity of its connexion with the surrounding parts; and the same circumstances will also distinguish it from pannus. Besides, pannus is generally occasioned by some prior disease, which it follows so promptly and regularly, that there can be no mistake as to cause and effect; or otherwise, there exists some condition of the mucous lining of the lids, adequate to account for, and give rise to, the morbid state of the cornea; and, lastly, it is never moveable upon the surface of the cornea, but is closely and intimately identified with its structure. And, independently of the want of that definite triangular figure, in the disease termed pannus, (which trian-

gular figure always characterises pterygium when situated upon the cornea) there is no continuation of disease, as in pterygium; no connexion or prolongation of morbid structure upon the sclerotica. It is just possible that the state of the cornea alone might prevent a surgeon from distinguishing the one disease from the other; but it will be remembered that, when the cornea is affected with pannus which assumes somewhat the character of pterygium, those appearances and that structure, which form the base or root of the pterygium, are entirely wanting.

Treatment.—We may sometimes arrest the progress of pterygium by the use of astringents and stimulants; and the cases in which they are most usefully employed for this purpose, are, when the pterygium is small and of recent origin, and is actually increasing in size. The common zinc wash, or the nitrate of silver or sulphate of copper drops, in the proportion of two or three grains to the ounce of water, are the best remedies for this purpose; and the patient may be directed to allow a little of the one or the other of these applications, as may be preferred, to be dropped upon the pterygium, from a common capillary tube, two or three times a day. If, by these means, its increase can be checked, then their use may be suspended, (and this is more particularly necessary when the nitrate of silver drops are employed, on account of their tendency to tinge the conjunctiva) for it not uncommonly happens that, when once the progress of pterygium is arrested, it will not again increase, or will at least remain stationary

for a long time; still, if at any future period it should evince a disposition to enlarge, the same practice may be again employed.

Escharotics were formerly much used, but their employment is now pretty generally discarded from our catalogue of remedial measures for the cure or relief of this disease; and very properly so, for, undoubtedly, they are very bad applications; and to them must be attributed many of those troublesome diseases, into which pterygium may degenerate from injudicious and mischievous treatment.

Scarifications have been frequently employed, and, I may say, successfully employed, for the cure of pterygium; but it is a tedious and painful mode of cure, compared with the operation of excision, that is, the partial excision of pterygium, for its *entire removal* is, in many instances impossible, always unnecessary, and sometimes very injurious. If we are quite determined to remove *every part and particle* of a pterygium from the surface of the cornea, we shall be very likely to exceed our intention, and to inflict that injury upon its texture which may be followed by staphyloma; and if we extend the operation very near to the inner canthus, a firm ligamentous band marking the course of our incision may, and, indeed, is very likely to, extend from thence to the cornea, and greatly interfere with the free motion of the eye-ball.

Instead of dissecting the pterygium *from* the eye-ball, it has been proposed to *divide* it near the junction of the cornea and sclerotica, (Acrel, Scarpa, Travers,) and before its adhesion to the former tunic becomes very intimate and extensive; or to cut

away a small portion of it only. And, again, with regard to the operation of excision, strictly so called, there are various modes of performing it—for whilst some recommend the operation to be commenced towards the base, (Beer, Mackenzie, &c.) others, again, advise that the apex be first elevated and removed, (Sabatier, Scarpa, Guthrie, Lawrence).

And then, with regard to instruments, there has been much difference of opinion, and, accordingly, knives of various curves, with sharp and blunt extremities, lancets, and scissors, and so on, have their respective advocates; but having already trespassed largely on the time of my readers, I shall proceed, at once, to describe the operation which my own experience and observation, derived from an unusually large field of ophthalmic surgery, have disposed me to prefer, and also such instruments as appear to me most suitable for use.

Operation.—The patient should be requested to lie upon a table or sit upon a chair, and, having the eye-lids well separated by an assistant, so as to expose the whole of the globe, (which should be steadied by the firm pressure of the index and middle finger on each side) the operator should grasp the pterygium with a pair of hooked forceps, and having raised it from the sclerotica, pass the probe-pointed blade of a *well-made* pair of scissors underneath the elevated portion, midway between its base and the margin of the cornea, and having divided that portion, as far as its union with the sclerotica will permit, he turns the scissors to the opposite side, which should be also divided in the same way; with a fine scalpel the pterygium may be then dissected

and detached from the sclerotica and the cornea by a succession of careful incisions, taking care that the flat side of the scalpel is directed towards the globe of the eye, so that its cutting edge shall be directed rather away from, than towards it.

If an incision be made upon the pterygium from its external side towards the globe, the sclerotica may be either cut or injured, or much unnecessary pain excited by partially dividing the pterygium in various places; or if, with a view of preventing the necessity of making several incisions, and with the intention of severing the whole of the pterygial production at once, the operator, in the plenitude of his courage and dexterity, makes one free section, the eye-ball may be either slightly incised or completely punctured; and if the scalpel be placed underneath, and the pterygium cut from within outwards, as Mr. Guthrie (p. 142) recommends, it may be raised, indeed, nearly half an inch from the eye-ball, and very probably *torn from* the sclerotica or cornea, rather than divided. And this is not merely a theoretical objection, but a matter of the most probable occurrence; and I have myself seen that portion of the conjunctiva situated at the upper part of the eye-ball, and which forms its point of reflection, pulled quite downwards, and nearly the whole of the conjunctive membrane raised, and absolutely *stripped from* the sclerotica and the eye-lid, during an attempt to detach a pterygium situated at the upper part of the eye-ball, in the mode recommended by Mr. Guthrie.

I may further remark, that the scissors employed ought to be rounded at the extremity of that blade

which is passed beneath the pterygium and pushed against the conjunctival fold which connects it with the sclerotica, lest it should penetrate or otherwise injure the eye-ball; and the same precautionary remark applies to any, and every, instrument which it may be considered necessary to pass beneath a pterygium for the same purpose, as it is quite impossible to prevent, in every case, by any care and precaution the operator may employ, the sharp point of an instrument from hitching upon or puncturing some important part in an unsteady eye, the muscles of which are contracting (as they will do under the excitement of an operation) spasmodically.

After the operation, the eye may be bathed with warm water to encourage the bleeding, and the patient directed to keep the lids closed; and in two or three days afterwards, a little zinc lotion may be employed, to stimulate and quicken the healing of the sore; and, as soon as granulations arise, or as soon as lymphatic deposition occurs, the surgeon should carefully watch the healing of the part, encouraging or repressing the granulating process as circumstances may require; and care should be taken, by an occasional inspection of the eyes, to prevent the adhesion of the eye-lid to the eye-ball, which may occur if the eye be tightly bandaged, and the eye-lids be permitted to remain in close contact with the globe for several days without being moved.

Instead of raising the pterygium with a forceps, as I have advised, before dissecting it from the sclerotica and cornea, it was formerly recommended for the same purpose, to pass a curved needle and

ligature beneath it. This direction is particularly given by Banister,* Wiseman,† Bidloo,‡ Pormannus,§ Heister,‖ Dionis,¶ Chandler,** and many other surgical writers, and they fancied it materially assisted in the performance of the operation, and obviated the risk of injuring the eye-ball which was otherwise incurred.

I should have mentioned that, after the excision of the pterygium, small portions of loose ragged conjunctiva may remain, or it may be difficult to take away the whole of the pterygium at once, and in either of these cases it is desirable to remove the loose portions by means of the curved scissors, at a subsequent operation, if they do not contract under the use of astringent applications; at all events, it is not right to attempt to destroy them by the aid of strong caustic and escharotic substances.

Such, then, is the brief account of the surgical mode of cure for those forms of pterygium which refuse to disappear under the use of milder measures. It is said that the membranous adipose pterygia never require excision; but I have frequently found it absolutely necessary to excise them, after having tried, without the slightest benefit, not only the catalogue of other measures mentioned at an earlier

* A Treatise of one hundred and thirteene diseases of the Eyes and Eye-liddes; by Richard Banister. London, 1622.

† Severall Chirurgicall Treatises; by Richard Wiseman. London, 1676.

‡ Godefridi Bidloo Opera omnia Anatomico-Chirurgica. 1715.

§ Chirurgica Curiosa. Translated by Sprengell. London, 1706.

‖ D. Laurentii Heisteri Institutiones Chirurgicæ. 1739.

¶ Cours d'Operations de Chirurgie; par M. Dionis. Paris, 1750.

** Treatise on the Diseases of the Eye; by George Chandler. London, 1780.

part of these observations, but a long list of others, which, at different times, and by various individuals, have been warmly recommended, but which I shall not fatigue my readers by describing in detail, as they, for the most part, act in obedience to a few general principles which are palpably evident.

SOME OBSERVATIONS

ON THE PECULIARITIES OF DISEASES

OF

INFANTS AND CHILDREN.

BY J. K. WALKER, M. D.

Senior Physician to the Huddersfield Infirmary.

[CONTINUED FROM VOL. 2, P. 422.]

I HAVE alluded, in a former paper, to the various epidemics which appeared at different times among children in this district, and the great influence which the invasion of such epidemics has on the amount of mortality at that tender age. Though in some years the reigning epidemic has almost excluded other diseases, as if it would, for a season, maintain a supremacy over the rest; yet, in other years, more than one epidemic has prevailed amongst children, and, in not a few instances, I have known rubeola, scarlatina, and variola, exercise their ravages in the course of the same year. In such seasons, on referring to the bills of mortality, there will usually be found a corresponding increase in the number of deaths. The invasion of these epidemics is not to be accounted for from meteorological phenomena, for they occasionally appear under every

state of the atmosphere, whether it is warm or cold, dry or moist; in airy situations, as well as the most confined; amongst the opulent, as well as the poorest of our population. It is true that a season of want and distress has appeared to give rise to some epidemics; but in the absence of these, or of any other obvious cause, sometimes after a period remarkably healthy, a season of sickness will suddenly follow, and a large proportion of the children of a district are, all at once, found to manifest similar symptoms, characteristic of the invading epidemic. I have already, in my former papers, mentioned many such periods. The subject seems shrouded in inscrutable mystery. It seems as if the existence of epidemics was irrespective of times and seasons, though most of them are more frequent at one season of the year than another. How far the physical agents around us modify the constitution of the air, is yet a matter of speculation. Certainly the chemical constituents of the air undergo no change. But whether epidemic diseases circle about in one continual series, or whether they appear irregularly, subject to no such law, or whether they are influenced by a certain occult diathesis of the air, or are produced by vapours exhaled from the bowels of the earth, is an enigma, which the short life of one man is inadequate to solve. And here permit me to add, that if there is one purpose more than another, to which your useful publication can more appropriately lend its pages, it is the solution of this difficulty; for it is a subject which can only be elucidated by the united observations of *professional men, living in*

different countries. We make great boast of our intellectual achievements, but on the subject I am now discussing, our knowledge is not more advanced than that of the most antient writers on medicine. The most favourite hypothesis of the present day is, that the earth is the cause of epidemics; which is no other than that handed down to us by Lucretius.

> Atque ea vis morborum, pestilitasque
> Aut extrinsecus ut nubes nebulæque superni
> Per cœlum veniunt, aut ipsâ sæpe coorta
> *De terrâ surgunt,* ubi putrorem humida nacta est
> Intempestivis pluviisque, et solibus icta.

The opportunity afforded me, during the last twenty years, of visiting the sick poor of this neighbourhood, has enabled me to state, that there have been hardly two successive years, without one or more epidemic making its appearance among children; and from enquiries which I have instituted in the neighbouring towns, I find the same is the case there. Neither can it have escaped observation, how frequently the same epidemic assumes a different aspect in different seasons; the disease sometimes manifesting greater determination to one viscus, sometimes to another. In the measles which prevailed in the year 1819, the disease was not severe during the eruption, but not unfrequently fatal from its sequelæ, on the disappearance of the rash; and this was sometimes the case where the previous cutaneous development was not defective; many of these cases terminating fatally. But in the same epidemic, which took place a year or two afterwards, the occurrence of laryngeal affections was

rare; but, instead of that, I observed a considerable number of mesenteric diseases supervening on the disappearance of the eruption. There was nothing in the circumstances of the two years, to account for this difference of the secondary symptoms. Few years have elapsed, since the establishment of the medical charity of this town, without cases of rubeola; yet, in some seasons, it has been so mild, as to require but slight assistance from medicine. In fact, the eruptions in many cases have been of so partial a nature, and with such a trifling degree of cough, as to create a doubt whether it was of so decided a character, as to afford protection against a future attack of the genuine disease. The same disparity, in different seasons, characterised other epidemics; the scarlatina, for instance, which has usually visited this town, or the surrounding villages, every two or three years, seldom, however, simultaneously affecting the entire district. One of the most serious of these visitations occurred in 1815-16, when scarlatina was more generally diffused than it has been at any subsequent period. It broke out in places the most clean, and the best ventilated; in high, as well as in low situations. Out of 1,611 patients admitted during the second year of the dispensary, more than 200 were cases of scarlet fever: of these, a very considerable proportion were children; and the mortality of that period was great, as the number of burials recorded in the parish register, sufficiently shews. The same epidemic developed itself more partially a few years after, but neither attended with the same virulence nor fatality: most of the cases were those of simple scarlatina. Occasion-

ally it has reappeared with unwonted severity; and during the year of 1833, the scarlatina appeared in the villages to the north and north-east of Huddersfield, under a very aggravated form—the tonsils, uvula, and velum pendulum, being, in many instances, extensively ulcerated. In the parish of Hickheaton, and in many parts of the parish of Halifax, the same epidemic prevailed at that time, with the same severity; and in both these instances the number of children that fell victims to the disease was very great; yet there was nothing in the locality of either of these districts, to enable us to account for the exclusive prevalence of the epidemic there, as the adjacent population was placed under circumstances apparently the same.

I wish it had been in my power to have announced the gradual disappearance of the small-pox, as one of our periodical epidemics in this district; but I regret to say, its invasions have neither been less frequent, nor less fatal, than some others, though, perhaps, less so than was the case anterior to the Jennerian discovery. But the mode of invasion of the disease, its progress, and degree of fatality, have varied in every successive epidemic; in some, with all the distinctive characters of small-pox; in others, in a more mitigated form; in some the head, in others the throat, became most affected: but it was never ascertained that any of the fatal cases had previously undergone vaccination. So severely, indeed, was the head affected, in some of the cases during the last epidemic, that it was necessary to resort to bleeding, which gave effectual relief in a few instances; while in others, leeches were more successful.

I may also extend the same observations to other epidemics, such as croup, hooping cough, &c. which present themselves under various modifications in different years, and appear more tractable in one season than another, though no satisfactory cause can be assigned, why the same class of diseases should at one time assume so mild a form, and, apparently under the same circumstances, should at another baffle all human remedies. On looking over the case-book of the infirmary, I find that, in some years, the number of children admitted is more than double that in others; though the sum total of patients is nearly the same. In one year there were 486 children, and in another 150 only admitted; and even in those years, where the number is nearly similar, there is often a wide difference in the mortality. Nor will the most favourable circumstances of locality exempt a neighbourhood from such epidemic visitations. It seems as if it were a law implanted on men, as well as animals, (doubtless for some wise purpose) that such visitations should occur. We see the same destructive principles at work in the vegetable kingdom, and under circumstances equally inexplicable as the occurrence of epidemics among mankind. How many thousands of seedling plants will often disappear in one night. Disease will now and then invade whole tribes of vegetables, so that not an individual of the species shall survive. But though there is some resemblance between this destructive principle, and the ravages committed by epidemics amongst the human race, yet the latter at least are, by the beneficence of a kind Providence, often susceptible of palliation.

It was usual to contend, before the Jennerian discovery, that the excessive waste of human life by the small-pox, was a salutary provision of Divine Wisdom to restrain, within wholesome limits, an increasing population; yet, how futile will such a mode of reasoning appear, when it is seen that it has been permitted to the ingenuity of man to chain the fell destroyer, that, like the fabled monster of old, could only be satiated by the blood of youthful victims. What has been the consequence?—a growing declension in the rate of infant mortality. It is true, cases of small-pox do occur, after vaccination; but this is an exception to the general rule; and where a case does occur, it is of so modified a kind as to be nearly free from all danger. It is with pain, I have to observe the neglect of vaccination among the working classes in this district, which is, in consequence, subject to periodical visitation of epidemic variola—often of a very fatal kind. So lately as the winter of 1832-3, it appears that of children attacked, under two years of age, in this parish, no less than 30 died; under seven years, 50. Since that time, I have heard of no cases in this district.

The records of medicine are too meagre to enable us to draw any correct conclusion on the modifications which diseases have assumed in different ages. Enough, however, is on record, to shew that, from some inexplicable changes, whether revolutions in the earth's bosom, or changes in the air, or in the human body itself, new diseases do from time to time occur, as well as modifications of old ones. Certain it is, there have been other diseases which

are either now extinct, or very rarely appear; and others, we now see, that were little known to the antients. We read of the sweating sickness, of the leprosy, and some others; and we have seen, in our own day, the ravages of that deadly invader, the cholera. It seems as if such as these appear for a season, and then vanish, perhaps, for ever—perhaps, to reappear after the lapse of generations. What changes may now be in process, or may hereafter occur, can only be matter of conjecture. We, at any rate, know of a change produced in one of the exanthemata by vaccination; perhaps, hereafter, a similar change may, by some happy discovery, be effected in other acute diseases of the skin. The lapse of ages may, at any rate, modify them; may even introduce a more malignant type. Who that reads Sydenham's account of Scarlatina, will identify it with the present, frequently, malignant form of that disease. "I think," says he, "it is proper to purge the sick (in scarlatina) with some gentle medicine that is agreeable to his age and strength; and by this simple and plain natural method, *this name of a disease,* for it is scarce anything more, may be easily and safely removed." It is evident from this, that to the scarlatina anginosa of modern authors, he was an entire stranger; for had this form of disease been common in Sydenham's time, he must, at least, have heard of it, and would have alluded to it; but no such disease is hinted at. Nor can I believe that small-pox, rubeola, or scarlatina, prevailed in the days of Hippocrates, who would otherwise have given us a description of them.

It is a subject of the deepest interest to inquire

into, the relative degree of frequency and mortality of diseases in this island, at the present and former periods. Which of the exanthemata have undergone a change? Whether scrofula is more prevalent than formerly; and under what circumstances? Is the increase in the class mimoses, with their endless train of consecutive symptoms, so great as is generally believed? With respect to the diseases of infants and children, is hydrocephalus more or less frequent than formerly? Certain it is, its occurrence is more common in one season than another; and, indeed, while it is extremely rare in one district, it is often more frequent than usual in other. This will, in some measure, account for the contending opinions broached on this subject: one practitioner asserting that cerebral effusion is more frequent than formerly; another maintaining the reverse. Dr. Golis (physician to the institute for the sick children of the poor, at Vienna) gives it as his opinion that hydrocephalus, as well as croup, is more common than at former periods; and he supposes that the cause of this change, is to be sought for in the less frequent eruptions on the heads of children, arising from some great revolution in the lymphatic system; since which the achores have gradually vanished, and the diseases of effusion have become more common in children. A later and equally able writer,* in speaking of this disease, in your last volume, says, "A few years ago, this was the scourge of families, and the opprobrium of the profession; but such cases present themselves much

* Dr. Brown, physician to the Sunderland and Bishopwearmouth infirmary.

less frequently than formerly, indeed, I would say, that this disease is diminished in frequency, within late years, in more than a tenfold proportion, compared with its prevalence twelve or fifteen years ago;" and he adds, "that he is warranted by experience in stating, that recoveries are much more frequent than formerly." In this opinion I entirely agree, having seen cases in which most, if not all the symptoms characteristic of hydrocephalus were present, such as suspended power of vision and hearing, convulsions, moaning and screaming, &c. &c. yet under such unfavourable circumstances, recovery has taken place. Such instances, I apprehend, do not unfrequently occur, and should teach us never to be too decided in our prognosis. But whether these hydrocephalic symptoms depend on pressure of blood from turgescence of the vessels, or effusion of water, is a question on which able men will differ. The question of the varying prevalence of this disease, however, can hardly be doubted, as the following returns will shew: out of 32,000 patients of the Huddersfield dispensary, there were only 13 which are marked as cases of hydrocephalus—8 of these are recorded as fatal.

In 4054 cases in the Halifax dispensary, 1 only, and that a fatal case of hydrocephalus, is mentioned.

From the report of the Birmingham dispensary, 1834, it appears that, in a table containing a sketch of the maladies of 2732 patients, there are 5 cases of hydrocephalus, all of whom died.

Out of 5833 cases in the Manchester infirmary, only 6 are mentioned as cases of hydrocephalus acutus.

But in 23,169 cases registered in the London bills of mortality, I find as many as 855 under the head of dropsy in the brain; convulsions, 2761; croup, 123; this is in 1831.

In another report of the London bills of mortality, in which 20,374 diseases are registered, there appear dropsy of the brain 676; this is in 1829.

There are several other returns of a similar description, now lying before me, but enough is here given to shew, that the frequency of this disease differs very much at different periods; and, making all due allowance for the careless, and often inaccurate manner in which these documents are framed, it is clear that more children have fallen victims to this disease in one year than in another; but to form a proper estimate of the present fatality of this disease, compared with that of former years, would require an elaborate investigation of the case-books of all the infirmaries in the kingdom. Indeed, it is only in these institutions that such estimates can be formed, after a long series of years; but it is much to be regretted that, with respect to many of these institutions, the list of diseases is often very defective, not always, indeed, owing to the inattention of the officers of the infirmary, but to the neglect of the patients, or their friends, in communicating the result of each case. Humanity, as well as science, is concerned in researches of this nature; and with the increased facilities afforded by the numerous medical charities now existing in almost every town in the empire, it would be inexcusable indeed, if this object were lost sight of. I am aware how difficult it is to classify the diseases of the out-

patients, with any pretension to accuracy, yet there is no excuse for the manner in which some admission-books are kept, where often not one case in five has the name of the disease attached to it; and with respect to the diseases of infants, the sweeping term "*morbi infantiles,*" is made to comprise, in many reports, an immense diversity of symptoms, and diseases the most opposite in their nature. If I wish to ascertain the cause of any visitation in the mortality of infancy at any given period, what aid does such a document afford me? Do I seek to know whether croup or hydrocephalus is more fatal now than in former years? In turning to the cases of infants, all that we are permitted to know is the sum total. There is not, even, an attempt to inform us what part of the body was the seat of the disease. It is on this account, as well as the comparative neglect of diseases of infancy (till lately so common among all grades of practitioners) that I have ventured to call the attention of your readers to the subject.

It cannot be doubted that, among other causes, the increased attention of the faculty to this branch of our art, has had its share in diminishing the mortality at that tender age; and what has already been done, is sufficient to urge us to further exertions. To those who have diligently watched the progress of infantile disease, it must frequently have happened to see cases, apparently the most hopeless, recover. Often when the spark of life appears on the point of extinction, (as is sometimes the case when a state of collapse has supervened)—the skill of the practitioner is triumphant over the power of

the disease. The cautious and repeated exhibition of a few drops of some diffusive stimulant, in a proper vehicle, aided by external warmth, has saved many infants from the grasp of death. And surely, where the result is such as to consign the little sufferer not to the tomb, but to the arms of its parent, the reward, to a feeling mind, will be greater than it is in the power of wealth to bestow.

The cases of out-patients of the infirmary of this town, for the last year, do not comprise so large a proportion of children, as in the year preceding, when small-pox was prevalent in the neighbourhood. It was a year, however, not unmarked with epidemics, as several cases of scarlatina, in its mildest form, were admitted, and a few of rubeola. Of the patients under the age of 14, there were—

Boys under 7 years old	107	
Girls ditto	115	
		222
Boys above 7 and under 14	124	
Girls ditto	96	
		229
Total of children under the age of 14		442

Of these only 18 deaths are recorded. There is little doubt, however, that there were other fatal cases, the result of which never reached us. Nearly the whole of the above fatal cases were under 7 years old, and two of the number were cases of infantile convulsions; three others were diseases of the lungs, and one of croup; and several cases of abdominal disease.

At the Bradford infirmary, for the same year, there were 384 cases of children under the age of

14 admitted, and 34 deaths. The sum total of patients of all descriptions, for the year, was 1922.

Nearly the same relative proportion of diseases under 14, prevailed at Halifax and Wakefield, as appears from the dispensary reports of those places. There was no very peculiar feature in the above cases admitted into the Huddersfield infirmary—nothing that strikingly distinguished them from the cases of ordinary years. The early part of the winter was characterised by incessant rain in this, as in other parts of the kingdom, and the weather was most tempestuous The temperature was generally low, descending even below the freezing point during the nights of the early part of the season, and accompanied by frequent fogs. The number of affections of the lungs among children was considerable, and the usual number of sore throats and catarrhs occurred: but not, I think, of a more violent description than is usually the case at that season. The cases of remittent fever, and of hooping cough were, with a few exceptions, of a mild kind. Though the cases of scarlatina (to which I have above alluded) were, for the most part, of a benignant type, yet the consecutive symptoms were not always so easy to overcome. In several instances, after the subsidence of the anasarca of the extremities, the abdomen became enlarged, and the stools indicative of mesenteric affection. There is a case of this sort, which was dismissed cured a few days ago. Adelaide Hirst, æt. 3, who was one of a numerous family, all of whom had a mild attack of scarlatina, and recovered, without any material impediment, except the child here alluded to, in whom

the abdomen began to increase in size, so as to make it doubtful whether there was not some effusion within its cavity. By a perseverance in the use of mercurials, and the iodine liniment, the size of the abdomen gradually diminished, and, under the use of small doses of iodurate of iron, returned to its natural state. The child is now completely restored.

In other instances, where children are subject to cutaneous disease, I have not unfrequently found, if not a fullness, a slight tenderness of the abdomen, which does not always attract attention, yet is capable of producing very active symptoms, especially if a casual retrocession of the eruption occurs. It is often desirable, in such cases, to apply a few leeches to the abdomen, which is usually followed by a decided improvement in the appearance of the stools, and prepares the system for the more ready action of a future remedy. Several cases of cholera were admitted, which were, I believe, all relieved; some by counter-irritants and iron; some by more active means. Of the cases of epilepsy, one is still under cure, though the fits are less frequent. The subject of this case is Miles Lamb, a boy of sanguineous temperament, and for some time previous, of a lethargic habit. Repeated cupping did not diminish the frequency of the fits; neither did a succession of blisters, aided by aperients make any impression on them. It was not until his mouth was affected by the mercury, that a temporary suspension of the fits occurred. They, however, returned as soon as the system ceased to be under the influence of that remedy.

Another case of equal severity is still on the books. It is that of a child æt. 6, Hannah Pogson, who, but a year ago, was in the enjoyment of perfect health, and now, along with the loss of the use of her lower extremities, labours under loss of intellect. She was attacked with hooping cough more than a year ago, during which she had the measles also; for both of which she was relieved by Mr. Lockwood, a neighbouring practitioner. She was gradually recovering from these affections, when she complained of coldness and numbness in her legs, which increased so much, as shortly to deprive her of the use of her limbs. Under the impression that the spine was the seat of the disorder, a variety of counter-irritants were applied to different parts of the spine; but so far from deriving benefit from this plan, the functions of the brain became affected, and a drivelling expression of fatuity supervened. On her admission to the infirmary, we found the paralysis of the lower extremities complete, (though she could move her arms) and her urine passed involuntarily. After a repetition of blisters, and tartar emetic ointment, had been resorted to in vain, we had recourse to the mercurial treatment, which, indeed, was followed by evident benefit; there was less of that fatuity of countenance, and, from the habitual use of friction, greater power of motion was given to the limbs; but the symptoms in other respects remain the same. Were this a case of simple paraplegia, without any suspicion of organic disease of the brain, there would be less objection to a trial of the strychnine, either internally or by applying it to the vesicated surface in gradually

augmented quantities. But the pernicious action of this alkali, where structural disease exists in the brain, has so often been proved, that I have felt great reluctance in resorting to its use, before all other expedients are exhausted: indeed, the issue under any treatment, is a matter of much uncertainty. As the claims of strychnine to the extraordinary powers assigned to it, are disputed by many, and its efficacy in cases unconnected with cerebral disease still questioned, I shall conclude this paper by communicating the case of a boy, George Roberts, who was an in-patient of the Huddersfield infirmary, for a paralytic seizure of the upper extremities, and who was treated with strychnine. The result of this case, though in itself most gratifying, cannot fail to shew, that its use, even where it is successful, is capable of producing the most appalling symptoms—such, indeed, as have, in other instances, terminated in death instead of recovery.

This patient had formerly been relieved for a disease of the cervical vertebræ. At the period of his admission he was unable to move his left arm, and had not the free use of his lower extremities; his head was drawn downwards to the left shoulder, and his articulation was indistinct; the pulse was natural; bowels regular; tongue clean.

Nov. 25th.—A blister was applied to the nape of the neck, and he took gr. iv. of the pil. hydrargyri every night. A stimulating liniment was rubbed twice a day on the back, with the occasional use of the flesh brush, and electricity.

He continued the pil. hydrarg. until the 18th of December, at which time the mouth was affected,

but without any apparent improvement. I therefore had recourse to the strychnine with less reserve, indeed, inasmuch as I was satisfied that the remedy would have a fair trial, under the judicious superintendence of our house surgeon, Mr. Clayton, from whose notes the following account is taken.

Dec. 18th.—A blister was ordered to the nape of the neck, and to apply to the blistered surface $\frac{1}{8}$ of a grain of strychnine.

The blister was kept discharging, and the strychnine applied twice a day, until the 23rd of Dec. when he complained of pain in the bowels, and some feverish symptoms; and, in consequence, the strychnine was omitted, and some saline aperient ordered, which he continued taking until the 4th of January, 1834, when he was in a state to resume the use of the strychnine, in the following pills. ℞ Strychninæ gr. i.; conf. rosæ qs. f. pil. no. x. Capt. pil. i. bis in dies. Cont. electricitas et frictio.

Jan. 12th.—Upon the whole better. Appetite improved; no twitchings. To take a pill, with $\frac{1}{8}$ of a grain, twice daily.

21st.—Still no twitching, nor any relief in the symptoms. To take a pill, with 1-6th of a grain, twice a day.

25th.—Has had some little pain in the head, which was removed by a smart purgative. ℞ Strychninæ gr. ij. in pil. ix. Capt. i. ter die.

26th.—Some twitchings in the arms last night, and pain in the head this morning. Bowels open; urine copious; pulse regular.

27th.—Pain of the head gone; twitchings the same.

The strychnine was gradually increased, without any visible amendment, until he took ½ a grain twice, and then three times a day; but on the 7th of February, about noon, whilst eating his dinner, he suddenly fell from his seat, his right arm forcibly extended, the teeth clenched, pupils immoveable, face of a livid hue, lower extremities quite stiff and stretched out. In this state he remained about twenty minutes. He was not, however, completely relieved for many hours, the same symptoms recurring in a less degree, and he could part with no water. Some brandy and water, with spir. ammoniæ comp. was given as soon as he could swallow, which, with the constant application of warm fomentations to the abdomen, and the use of liniment, &c. eventually relieved him. His bowels were freely opened, and in the evening he passed some urine.

Feb. 8th—Complains of great weakness and sickness. To continue the ammonia.

9th.—He now parts with his urine as usual, and his bowels are open, though he still complains of some pain, as well as sickness. Pulse 74; heat natural. ℞ Spiritus ammoniæ comp.; spir. lavand. comp. āā f. ʒij.; misturæ camphoræ; infus. cascarill. āā f. ℥iv. M. capt. ℥i. ter in dies.

14th.—Better in every respect. Rept. mist et capt. pil. aloes comp. no. ij. h. s.

24th.—Has been gradually improving since the fit, and has regained the free use of his legs and arms. Says that he has occasional pain in his bowels, for which he was ordered the magnesia mixture, with a few drops of tinct. opii.

On the 28th he felt himself so well, that he was permitted to leave the house. About two months afterwards he appeared to be even better than when he left the infirmary.

AN ESSAY

ON

PUERPERAL CONVULSIONS.

BY J. T. INGLEBY, ESQ.

Member of the Royal College of Surgeons, and Lecturer on Midwifery at the Birmingham School of Medicine.

Convulsions and uterine hæmorrhage are justly considered far more dangerous in their consequences than any other affections which depend upon pregnancy or parturition, and, as respects the practitioner, are inseparable from the heaviest responsibility. There is, however, a very striking difference between hæmorrhage and convulsions, alluded to by Dr. Joseph Clarke, in his admirable observations on the subject, viz. the rare occurrence of hæmorrhage in a case of first labour, whilst convulsions, though occurring under all circumstances of pregnancy, arise far more frequently in a first than in any subsequent gestation.* For the best account extant, of convulsions, we are indebted to Dr. Denman; and the unsettled state of practice which he there

* In Clarke's 19 cases, 15 occurred in the first pregnancy. In 48 cases recorded by Dr. Merriman, 36 were first cases. A large proportion of those contained in the present essay, arose under the same circumstances. This liability may partly be explained by the well known fact, that the disposition to convulsions diminishes with the increase of age.

complained of, remains very much the same at the present day. He observes that "the rules given by different writers for the management of labours attended with convulsions, seem to have been founded on less certain principles, and to have been less confirmed by experience, than those which have been given for almost any other cases that can occur;" and again, "there is yet room for improvement in our knowledge of the causes, effects, and treatment of convulsions, depending on pregnancy and parturition." Dr. Dewees describes three forms of convulsion, viz. the hysterical, the epileptic, and the apoplectic. Velpeau describes a fourth, or the tetanic. Baudelocque describes the cataleptic, also; and to these another might be added, and termed the anæmic, embracing that distinct class of convulsions which depend upon large effusions of blood. It is more common, however, to consider the disease as arising from irritability on the one hand, and plethora on the other; and provided we acquire accurate ideas of the state of the brain, during the fits, we shall not be in danger of being misled by names. Puerperal convulsions, properly so called, differ most essentially from convulsions which occur from hysteria, and will be found sufficiently distinct from this affection, for all purposes of practice. Hysterical spasms, or partial convulsions, to which nervous and highly excitable women are very liable, (usually during the term of pregnancy, but rarely during labour)* are accompanied with a spasmodic

* Hamilton says, that regular hysterics seldom happen during a late period of pregnancy, and never during labour; a statement to which an exception may be made.—See Practical Remarks on Convulsions, in the 5th volume of Annals of Medicine, p. 313.

state of the trunk and extremities, globus, palpitations, distension of stomach and flatulent eructations, and other symptoms of hysteria; but neither with stertor nor coma, and rarely, if ever, by convulsion of the muscles of the face. The pulse, though small and frequent during the paroxysm, regains its natural state on the fit disappearing. The hysterical species, in its mode of attack, duration, degree, violence, and the perfect recovery of the patient on the subsidence of the fit, is so very different from eclampsia, that a man must want common sagacity to confound the one with the other. As for the apoplectic species, without sanguineous effusion, it is really a distinction without a material difference; it differs only in degree, and usually appears during labour. The term "puerperal convulsions" should be confined to cases occurring in paroxysms affecting the contractile tissues generally, and, in many respects, resembling epilepsy, although the attack cannot be regarded either as apoplectic, epileptic, or tetanic, but partaking somewhat of the characters of each of these diseases. Not only may simple apoplexy arise from mere fulness of the blood vessels, but many of the symptoms which characterize epilepsy, including the wounding of the tongue, may be produced by an effusion of blood. The circumstance of blood-letting proving so efficacious in puerperal convulsions, militates strongly against its genuine epileptic character, for bleeding in common epilepsy is usually injurious; moreover, the disease does not leave the patient exposed to attacks of chronic epilepsy. Dr. Hamilton prefers retaining the old term eclampsia, the word still

used by the French, as expressive of this affection, rather than substituting the term epilepsia, for the following reasons:

First.—The premonitory symptoms (during pregnancy) being well marked.

Second.—The first invasion of convulsion being soon followed (in many instances at least) by other paroxysms.

Third.—The immediate return of sensibility (in some cases) on the paroxysm ceasing.—This remark must apply to the circumstances of the first or second fit. A repetition of genuine puerperal convulsions will not fail to produce the same tardiness in recovery, as is noticed in epilepsy.

Fourth.—In a few instances, by the increased sensibility of the external senses.

Fifth.—The absence of the aura epileptica.

Sixth.—The pulse being more or less affected during the remission of the fits.

By Sauvages puerperal convulsions, are included under the genus eclampsia; but there is one symptom which does not belong to eclampsia, viz. the foaming at the mouth, otherwise this genus would be perfectly appropriate. True epilepsy in its nature is purely chronic. Puerperal convulsions, or acute epilepsy, according to Vogel, is an acute chronic disease, and far more violent and dangerous than the ordinary form of epilepsy. But, independently of other objections, the term epilepsy, by conveying an idea unfavourable to depletion, is inappropriate. Convulsions cannot be regarded as an idiopathic disease, but as an effect of some lesion, either of function or structure, capable of

exciting the strongest involuntary movements in the contractile tissues generally.

Respecting the comparative frequency of puerperal convulsions, as well as its comparative fatality, authors are too vague and contradictory to permit any conclusion to be drawn. The disease occurs with sufficient frequency to claim our closest attention; and its great fatality has been admitted by the first men of the age.

Causes.—The remote causes of puerperal convulsions are essentially connected with a state of the uterus, which produces a morbid susceptibility of the nervous system. That pregnancy and parturition are the predisposing causes, may be fairly assumed, since eclampsia arises, with very few exceptions, in those states of the system only, and clearly originates in uterine irritation. Dr. Bland held a contrary opinion; yet some women are so prone to convulsions, as to experience the attack in every successive labour: very slight uterine pains will throw the whole muscular system into contraction. But, in the great majority of cases, a deranged circulation of the brain precedes the actual fit. The attack may possibly arise independently of any previous fault in the circulation, especially in persons of hereditary predisposition, spare habit, irritable temperament, high mental refinement, and in whom the excitability of the nervous, and subsequently the sanguineous, system, is called forth by causes apparently trivial. The position assumed by Hunter, Denman, and others, that convulsions frequently arise in weak and irritable subjects, accords with experience, since persons of spare habit are prone

to excitement both of the vascular and nervous system. In such constitutions, the strong susceptibility of the nervous system, when not congenital* or manifested during dentition, is subsequently acquired by the force of education, or irregular habits of life; and displayed, both morally and physically, from an early age to the middle period of life. During a first pregnancy these tendencies are increased tenfold: the brain, in particular, from participating very actively in the uterine excitement, is unequal to the supply of unimpaired nervous energy. It is probable that atmospheric influence, acting primarily upon the nervous system, may affect the brain, either directly or by producing excitement in its sanguiferous system. If we advert, for a moment, to the changes which result on the descent of the ovum in utero, the number, progressive size, and activity of the uterine vessels, and the excited state of the lining membrane in the secretion of lymph, we cannot feel surprised that sympathies naturally so strong should, in the early weeks of pregnancy, quicken the circulation in the brain, and otherwise strongly influence its functions. Even at the menstrual period, especially in dysmenorrhœa, the excitement in very irritable females amounts to

* Greatly as the subject of the utero-placental circulation may admit of controversy, it cannot be doubted that whatever acts injuriously on the mother's system—for instance, anger or other mental emotions—may exert an influence over the nervous system of the fœtus. The convulsions of early infancy cannot altogether be disconnected from these causes. In a case of convulsions, related by Spence, which proved fatal, there was not any dilatation of the os uteri; the Cæsarian section was immediately resorted to, and a living infant extracted, but convulsions terminated its existence within an hour.

absolute convulsion. It follows, then, that in similar constitutions, especially when moral impressions are superadded, the brain and nerves will be exceedingly susceptible during the whole period of gestation. It may be asked what is the exciting cause—or how does pregnancy act in the production of the fit? The precise manner in which the nervous influence becomes sufficiently disturbed to produce convulsions, does not always admit of demonstration; and no single cause can be assigned as applicable to all cases. It is equally difficult to explain the production of tetanus from a wound; convulsions from dentition, or from worms in the intestines; paralysis of the optic and auditory nerves, whilst the vessels of the brain appear perfectly natural. Irritability of the uterus, through the nerves of organic life, sympathetically reacting upon the muscular system, appears to be the immediate cause of the paroxysm.

The voluntary muscles derive their nerves mainly from the spinal marrow; still, from the close sympathy subsisting between the uterus and the cerebro-spinal system, through the medium of the nervous ganglia of the great sympathetic, irritation may be directly excited adequate to produce the most alarming forms of convulsion.* Possibly the researches of Bellingeri, Bell, and others, may ultimately explain many circumstances, relative to deranged nervous actions, which are at present involved in

* I presume that Hunter refers to this state of the system, when he speaks of the attack "killing like an electric shock."—MS. Lectures.—In the convulsions of infants when teething, life is destroyed in the same manner.

mystery. My own observation, that the seizure occurs in robust and plethoric habits, is confirmed by Dewees, Ramsbotham, and Velpeau: by the last it is stated, also, that convulsions attack women who menstruate frequently and freely, and nervous women—"*maux de nerfs.*" It has been affirmed that the fits arise most frequently during the night; a circumstance favouring the opinion of its being a disease connected with congestion of the brain and spinal marrow. Dr. Blundell attributes the convulsions, in most cases, to increased action of the cerebral vessels; an opinion borne out by Merriman, who found the blood not only inflamed, but cupped also—a circumstance, I believe, not unusual at the close of pregnancy. In addition to these coincident circumstances, the bulk of the uterus, in advanced gestation, is calculated to promote a tardiness in the venous circulation, viz. engorgement of the cerebral veins, calculated to impede the return of blood to the heart; whilst, under an increased power of the heart and arteries, serous effusion will be directly promoted. Hence the advantage of taking blood from the jugular vein, in preference to the temporal artery; and *vice versa;* according to the state of the circulation. It has been said that the pressure of the gravid uterus is uniform: a statement far from correct. In some pregnancies the uterus distends much more at its posterior and lateral parts, than it does at its anterior; so that a woman shall appear much smaller in one gestation than in another, although the volume of the uterus, and its contents, may be equally great. The pres-

sure, when exerted over the intestinal canal, by oppressing the circulation, tends most materially to produce eclampsia. In several instances, I am certain that scybala were retained in the bowels for many weeks before delivery, notwithstanding a daily evacuation. Thus hæmorrhoids, tumefaction of the labia, œdema of the lower extremities, and a varicose state of their veins, prevail, according to the seat and degree of pressure: œdema of the hands and face, and epistaxis, arise in the same way. To this view of the subject (which in practice has been acted upon to an injudicious extent) may be traced the opinion, that delivery is indispensable to the patient's safety; but whatever may be the predominant features of the paroxysm, immediate attention should be directed to the state of the circulation. Whatever suddenly affects the momentum or velocity of the blood, either by diminishing or increasing the frequency or force of its circulation, cannot fail to influence, very materially, the functions of the brain. It is now well understood, that the brain cannot long be deprived of the natural impulse in its arteries with impunity; and when the balance of the circulation is lost, and the supply of nervous power, both to the voluntary and involuntary muscles, is interrupted, the train of symptoms which characterise a fit of convulsion then ensues. Andral, in particular, has shewn that states of anæmia, as well as of hyperæmia, are equally productive of convulsions; and although it is maintained by some, that the amount of fluids within the cranium can undergo but little change, the position of Andral is confirmed by daily experience. Allow-

ing, therefore, for complications and variations of constitutions, the more important convulsions of the puerperal state may be referred to two principal and opposite conditions of the system; either an excited or turgid state of the vessels of the brain (often promoted by improper diet, and a neglected state of the bowels during gestation); or by loss of blood, as after a dangerous hæmorrhage. There is also a third state, subordinate to those just mentioned, and which seems more immediately dependent upon excessive sensibility of the uterine fibres, since it generally happens under an irregular and highly painful action of the uterus, during its dilatation, and usually in first labours. But admitting the seizure to depend here upon mere morbid sensibility, the circulation will generally be found more or less faulty, as the straining made in the progress of dilatation will occasion an increased force and velocity of the circulation, and bleeding may be a most judicious precautionary measure. Besides these causes, convulsions which arise after the os uteri has acquired a moderate degree of dilatation, may sometimes be traced to malformation either of the pelvis or head of the infant.

According to Denman, abdominal inflammation is common to convulsions after delivery. Gooch, also, speaks of peritonitis following convulsions; and in an instance of the disease which arose before delivery, and which is detailed in another part of this paper, extreme tenderness of the abdomen was a very prominent symptom, and continued until the patient had been bled a number of times. M. Duges observes, that serous plethora, or the ana-

sarca which often accompanies a first pregnancy, especially if the œdema extends to the face and upper extremities, predisposes to eclampsia: and Velpeau is of the same opinion. I. F. Osiander also considers a tumid condition of the hands and face as premonitory of the attack; but Miguel questions this doctrine. That convulsions have frequently occurred in connexion with œdematous states of the system, is shewn by experience. But is it not more agreeable to the principles of medical science to consider both complaints as the effect of a common cause, viz. an embarrassed circulation, rather than to regard the one as the consequence of the other? It has been affirmed that this disease reigns epidemically, connected, probably, (as Andral observes) with electrical states of the atmosphere. The particular influence of the air is alluded to by those accurate writers, Drs. Smellie and Denman. Madame Lachapelle remarks, "when one of our women is taken with convulsions, we rarely fail to have, soon afterwards, others in the same state." A fact confirmed by Ramsbotham, who says, "I have repeatedly remarked, among the numerous patients of the Royal Maternity Charity, as well as among others to which I have been accidentally called, that several cases have occurred soon after each other." This condition of the atmosphere has also been referred to by other eminent writers. A variety of other causes, of a subordinate kind, are mentioned by authors.

Periods of occurrence.—Puerperal convulsions are noticed at four particular periods: 1st, during pregnancy, and prior to the accession of labour; 2nd,

during labour; 3rd, after the birth of the child, and before the detachment of the placenta; and also from portions of placenta remaining in utero after disruption; 4th, after the complete expulsion of the placenta. It has been said that convulsions which arise antecedent to labour, cannot strictly be denominated puerperal. Convulsions, it must be observed, rarely occur before the completion of the seventh month of pregnancy; but should they arise in the early months, they may unquestionably depend upon the state of the uterus. Convulsions have occurred in the second month; and in two cases related by Perfect, the attack preceded quickening: but at these early periods they are rarely attended with danger. With respect to their occurrence in the last month of gestation, although the paroxysm mostly appears during the actual dilatation of the os uteri, or on the first approach of labour, still, when we recollect that in the last two or three weeks of pregnancy the neck of the uterus is fully developed, the subsequent changes being confined to the os internum (the most irritable part of the organ) it cannot be surprising that, in very irritable persons, a serious impression should be made upon the brain at those periods. When arising prior to the accession of labour, the attack is almost invariably preceded by derangement of the sensorial functions, denoted by some of the following symptoms: drowsiness; a sense of weight in the head, especially in stooping; beating and pain in the head; redness of the conjunctiva; numbness of the hands; flushing of the face, and twitching of its muscles; irregular and slow pulse;

ringing in the ears; heat in the scalp; transient but frequent attacks of vertigo, with muscæ volitantes, or temporary blindness; derangements of the auditory nerve; embarrassment of mind and speech; an unsteady gait, and constipation. There are sometimes pain in the epigastrium—a very characteristic symptom; vomiting, and other marks of gastric disorder. It is also said that a sense of weight and pain has affected the hypogastric region. These premonitions, though in some instances scarcely cognizable, are in others very clearly marked; and justify the imposition of a prudent restraint over the patient, both mentally and physically. Even under a strong predisposition to convulsions, the attack may generally be prevented by bleeding, daily laxatives, a simple diet, and mental quietude. Whenever a woman has been the subject of puerperal convulsions, the necessity for adopting these precautions in a subsequent pregnancy, especially towards its termination, and for maintaining tranquillity of the circulation, must be obvious. Restless nights, when associated with thirst, feverishness, and exitement in the pulse, have not unfrequently proved the precursors either of apoplexy, convulsions, or hæmorrhage. If these be not averted, the patient will be exposed to increased action of the cerebral vessels, and the consequent effusion of serum. A very healthy looking young woman (in whose several pregnancies, three in number, these symptoms were strongly marked) fell a sacrifice to cerebral inflammation, so late as the third week after delivery. Possibly the previous attacks had induced some slight change of structure in the arterial system of the brain.

Premonitory symptoms are rarely observed in the convulsions of labour. Excessive restlessness, however, may be considered as the harbinger of an approaching fit. It is said that rigors and delirium have also been noticed. I am not here alluding to a mere incoherence which occasionally appears during the dilatation of the uterine orifice; a peculiarity familiar to most observing practitioners, but formally noticed by a very eminent writer, Dr. Montgomery.* An attack so transient in duration, and unimportant in character, can scarcely be confounded with more serious conditions of the brain. The indications of an attack after delivery are still less apparent, and perhaps no cause can be assigned in addition to an overloaded state of the bowels, except turgidity of the blood vessels.

Convulsions which arise after delivery, are considered, by Dr. Ramsbotham, as peculiarly fatal in their consequences: a conclusion at variance with my own more limited experience, and also with the observations of Velpeau. When the lower extremities become materially œdematous in the latter months of pregnancy, in women of unimpaired constitution, Dr. Hamilton confidently declares that "copious bleeding alone prevents the occurrence of convulsions, either before or during labour." Denman, again, speaks in commendation of bleeding, in the following terms: "Bleeding is known to lessen, in a very material manner, all the complaints in pregnancy which arise from uterine irritation. It is, therefore, I may say, universally recommended in all cases, where these convulsions exist, or are to

* See Dublin Journal of Medical and Chemical Science.

be apprehended." Generally, however, as depletion is now practised, its efficacy in removing the paroxysm, and permitting gestation to proceed, is either not acknowledged, or not yet estimated according to its high and practical importance.

As regards the anæmic form of eclampsia, I may briefly observe, that convulsions which result from hæmorrhage, and succeed syncope, are not only more dangerous than the other forms, but often far more violent than we might, *a priori*, suppose. The symptoms which characterise this class of convulsions, are—contortion of the muscles of the face, whilst those of the extremities are but little affected; attacks of syncope; a small and frequent, but sometimes slow, pulse; collapse of the features; coldness of the extremities, and an exsanguine countenance. A similar seizure, though milder in kind, now and then occurs at the close of a very tedious labour, and is merely an evidence of exhaustion. These diagnostic marks are the converse of those which distinguish convulsions in contrary states of the system. In these cases of exhaustion, the ergot of rye, camphor and musk, together with ammonia, aromatic confection, and other stimulants and cordials, are suitable remedies; but opium is the grand restorative; its agency in sustaining and equalizing the circulation, and subduing spasm, places it almost beyond value. In the interval between the paroxysms, it may possibly be necessary to perform transfusion. The head should be maintained in a low position; sinapisms applied to the feet; and stimulating liniment rubbed in the course of the spine, and gastric and cardiac regions. Nourishing broths

taken by the mouth, and injected into the bowels, will be highly proper; and should the œsophagus be paralyzed on the convulsion subsiding, the elastic tube must be had recourse to. In the event of the question of delivery arising, the directions laid down elsewhere will be strictly applicable.* The paroxysm of genuine eclampsia cannot be attended with any deception, on account of its great peculiarity. The attack occurs suddenly, and, from its terrific character, occasions the greatest alarm and confusion. The patient, if in the erect position, suddenly falls to the ground; sometimes with a shriek. During the continuance of the fit, the determination of blood to the head is very manifest, by the throbbing of the carotid arteries; the distension of the superficial veins of the head and neck; the injected state of the conjunctiva; and the swoln and almost purple state of the upper part of the body. The patient is insensible to external impressions; the body and limbs are very rigid, alternately flexed and extended, occasionally agitated by spasmodic twitchings, and the trunk is thrown backwards; the face is distorted; the mouth drawn aside, and in constant motion; the teeth are forcibly set together, emitting the hissing noise spoken of by Dr. Denman. In rare cases, the mouth has been observed to remain open. From the spasmodic contractions of the jaw (which has even been luxated by their violence) the tongue is generally wounded, and saliva, tinged with blood, issues from the angles of the mouth. The respiration is hurried and irregular, having occasionally long suspensions; there

* See the author's treatise on uterine hæmorrhage.

is a rattling noise in the throat; the eyes are wild, fixed, and open, leaving the white part only in view—sometimes they open and close, and turn round, with great rapidity—the pupils are dilated, and, when the fit continues long, insensible to light; the breathing is stertorous; the sleep profound; the pulse unusually labouring, slow, hard, and full, with intermissions, but it soon attains a great degree of frequency and quickness; and the sphincter of the bladder, and sometimes that of the rectum also, lose their action. The duration of the actual fit is usually about a minute, or even less; it varies, however, from one to five minutes, or, as some authors say, even to an hour; recovery from the fit is sometimes momentary, and sighing usually announces the return of natural respiration; but too frequently one fit is followed by another, of which a slow state of the pulse is very characteristic. When the paroxysm frequently occurs, the deprivation of sense is, for the most part, permanent. The number of fits is almost indefinite. When the fit arises during actual labour, the convulsion may regularly recur with the return of pain; and, on the fit subsiding, the patient stares in a wild and vacant manner, and, though unconscious of what has happened, is either perfectly calm and rational, (a most favourable feature) complaining of pain in the head and perhaps in the epigastrium, or otherwise falls into a comatose state. The return of sensibility may be instantaneous, but is for the most part gradual, corresponding, in this respect, with the subsidence of the fit. There is, in this case, a confusion of the senses; the articulation is at first defective, and

vision imperfect; indeed, both the optic and auditory nerves have been known to undergo a temporary paralysis. The expression of countenance, also, remains very heavy, and the face continues swoln. When the result is not fatal, the intellect remains unimpaired in the great majority of cases. It appears singular, on reflection, that the functions of the brain shall present such contrariety of character within the very shortest period: at one time the patient is agitated by a convulsion inconceivably frightful, and speedily recovers; at another she lies motionless and senseless, having either the apoplectic stertor, or possibly breathing with tranquillity; and on recovering speech and motion, the mind wanders from the slightest incoherence or loss of memory, to the greatest rhapsody. At this juncture the connexion between this state and puerperal mania is so striking that the most observing practitioner, if unacquainted with the previous symptoms, would probably be deceived. I am acquainted with several cases of puerperal convulsions, which were succeeded by puerperal mania: the transition might, probably, be the result of the large bleedings which were necessary to subdue the primary disease. Peritonitis and ramolissement of the brain are said to be the result of the convulsive paroxysms; but both maniacal or abdominal affections are unfrequent terminations of eclampsia. The patient may die in the first fit, or after the occurrence of a great number of fits. Death rarely occurs just at the close of the paroxysm, but in the coma which succeeds it, or rather from asphyxia consequent upon the deteriorated state of the pulmonary function, of which the

purple state of the skin is so characteristic; or otherwise when life is protracted beyond a few hours. As paralysis is a most uncommon result of convulsions, an esteemed friend has suggested to me, whether serum so commonly found between the membranes of the brain, may not be the result of venous transudation after death; an opinion, I think, not borne out by experience, and, consequently, which ought not to influence our practice.

Pathology.—It has been shewn by pathological research, that increased vascularity and turgescence of the meninges, veins, and sinuses of the brain, prevail in the great majority of these cases. Connected with extreme fullness in the cerebral vessels, Denman found that the heart was unusually flaccid. An effusion of serum between the arachnoid membrane and pia mater, and also in the ventricles, (according to my own observation) is the morbid appearance most frequently met with. In a few instances, blood has been found extravasated both within the cranium and the theca vertebralis. In many instances the morbid changes have been disproportionate to the violence of the attack, whilst in others no unusual appearances, either in the spine or any other part of the body, have been detected. Bloody points have sometimes been discovered on making a section of the brain. In some cases, observes Ramsbotham, "the blood vessels of the pia mater have been found visibly surcharged, whilst those supplying the medullary and cortical part of the brain have appeared almost bloodless.* It has been remarked, that many of the appearances of

* 473 Cyclop. of Practical Med. p. 249.

vascular turgescence which have been observed in the brain and spinal chord, are the mere accidental effects of the violent struggles of the patient in her last moments; the same as appear in all cases of violent death. Although this statement is not altogether unfounded, the turgidity may be explained by the symptoms alone. The uterus has, I believe, been uniformly found in a natural state; but marks of abdominal inflammation have occasionally been detected. The spine has been rarely examined.

Prognosis.—To give an unqualified opinion in favour of recovery, even in the mildest cases of genuine puerperal convulsions, would be most imprudent, considering the liability of the paroxysm to recur. It has been already observed, that the attack which appears during the progress of labour is attended with the less danger; whilst the paroxysm which arises primarily, either antecedent to labour, or subsequent to delivery, and is marked by frequent returns, and an intervening coma, is inseparable from danger, and which is proportionate to the suddenness, frequency, and violence of the attack, and the profundity of the coma. The danger to be apprehended from convulsions which follow large effusions of blood, will be in an exact ratio to the enfeebled state of the sensorium. In all cases, therefore, our prognosis must be regulated by the particular circumstances under which the convulsions may arise.

Treatment.—In the treatment of sthenic convulsion, having cut short the paroxysm, our grand object should be to remove the coma, and guard against the paroxysm recurring; two leading prin-

ciples must engage our attention: first, to allay excitement, or to relieve turgidity of the blood vessels of the brain; and, secondly, in the failure of general treatment, to lessen the volume of the uterus, either by the discharge of the liquor amnii, where the case occurs antecedent to the sixth month of pregnancy, or by the entire evacuation of the uterus, when subsequent to that period. The objection to trusting to the rupture of the membranes, consists in the uncertainty when labour will ensue. An instance of severe "eclampsia puerperarum" is published in the Annal. Univer.* in which the membranes were ruptured by means of a trocar, still labour did not take place for twenty-nine hours. The patient recovered. Dr. Maunsell "lately ruptured the membranes in a case of convulsions at the sixth month of pregnancy, after all other means had failed. Labour was completed in four hours after, but the woman did not recover."† Thus the treatment must be regulated according to the period of pregnancy or labour at which the fit occurs. Convulsions which precede labour are imminently dangerous. Thus Dr. Hull observed to Professor Burn, that in every case which terminated unfavourably, there was no dilatation of the os uteri, and, consequently, no labour. The most manageable form of convulsions, is that which arises during the dilatation of the uterine orifice, as then delivery, which should be promoted with as little delay as possible, is so greatly within our control. The irritability of the nervous system, to which this seizure may

* See Med. Chir. Review, July, 1833.
† Dubl. Pract. of Midwifery.

usually be ascribed, is unattended with that marked derangement of the circulation which characterises convulsions preceding labour. As respects general treatment *active* and *early* depletion is indispensable. Bleeding, which is borne exceedingly well, must be enforced before effusion has taken place, or a permanent impression has been made upon the brain. This is a point of the greatest moment. The tremendous impetus with which the blood is sent to the brain, must necessarily inject the minute vessels. Under the frequent recurrence of the fit, effusion takes place within a very short space of time, I think, within an hour, or even less time : a circumstance explanatory of the ill success which sometimes attends artificial delivery, even in cases the best adapted for it. The fact of the coma ceasing, and sensibility being restored, is no argument against the existence of the effusion. In apoplexy, with extravasation of blood, a copious bleeding will sometimes be followed by temporary recovery ; yet the coma shall return without the apoplectic symptoms, and the patient sink in a few hours. Velpeau observes, that bleeding is almost the only remedy on which all are agreed ; but few practitioners will, I apprehend, coincide with this author and Cruveilheir, in advocating small bleedings, instead of depleting with vigour. In justification of small in preference to copious bleedings, Velpeau urged that Mauriceau and Madame Lachapelle bled largely and lost their patients, whilst Merriman, who bled less freely, saved two-thirds. To justify this inference, the cases should have resembled each other in all particulars ; but this is not the

case, and, consequently, the deduction is founded on narrow and unsound principles. If bleeding is performed with a view of allaying inordinate action, and diminishing the resistance of the cervix or os uteri, and thus to allow delivery to be accomplished, the amount of blood abstracted must be sufficient to answer the intended effect. Small bleedings will neither relax the uterus nor prevent the serous effusion, which takes place so rapidly; and then, and not before then, the question of small bleedings may be raised. Velpeau admits most fully, when contrasting the success of the English and French practice, that of 22 cases treated antiphlogistically by Merriman, 6 only died, whilst at *La Maternité* almost as many deaths occur as recoveries. The question is not whether the patient has lost blood, but whether the bleeding was resorted to immediately, and was in amount commensurate with the urgency of the case, for upon these circumstances the success of the measure will entirely depend. The temporal artery may be opened during a fit, for it would be scarcely possible then to open a vein in the arm on account of the spasmodic state of its muscles; and little blood would be abstracted if it were opened. On the fit subsiding, from twenty to thirty ounces should be taken freely from the arm (forty have been taken away); and unless decided relief be soon obtained, the operation must be repeated, perhaps several times, whether delivery be effected or not. We cannot, however, define the amount of blood which it may be needful to abstract, since this must correspond with the urgency of the case, and its abstraction should be both

general and local. Gooch used to observe, that he had never seen a single patient die from convulsions, unless the lancet had been unemployed or employed inefficiently. By general bleeding we not only relieve the circulation, but, by subduing tension, relaxing the whole muscular system, and the uterine fibres in particular, the delivery, should it soon follow, whether naturally or artificially, is rendered comparatively safe and easy. By opening the temporal artery or jugular vein, or otherwise by cupping or abundantly leeching the temples and behind the ears, the brain is especially relieved. It may be prudent to bleed, although the os uteri is dilated or dilatable when the convulsion arises, and the propriety of speedy delivery may be too obvious to admit of doubt. The French authors coincide in opinion with our own, in referring one form of convulsions to sympathetic irritation, and advising sedatives. Assuming the line of demarcation between the different forms of the disease to be well marked, still, when the force and frequency with which the blood is transmitted to the brain, during the paroxysm, are considered, the propriety of treating the case by fœtids, sedatives, and turpentine, to the exclusion of bleeding, may legitimately admit of question; whilst, in advanced pregnancy, the fullness of the vessels, which then so commonly prevails, at least aggravates, if it does not directly excite, deranged nervous action. But this state is far more successfully treated by depletion, than by any of our antispasmodics: indeed, nervous medicines, commonly so called, are decidedly improper either under an oppressed or excited state of the brain.

Whether general bleeding be admissible when the fits have ceased, and the symptoms of effusion have appeared, is a nice but important point to determine. Should it be undertaken, the greatest precaution must be exercised, and its effects on the circulation narrowly observed, whilst the blood is flowing; it is greatly, however, to be feared, that false pathological views, respecting serous plethora, have much restricted the depleting system. If doubt exist, it is better to risk a moderate bleeding than to neglect it; but in protracted states of coma, cupping is not only the safest, but the most effectual method of relieving the oppressed state of the brain.

From the difficulty of conveying medicines into the stomach, and the determination of purpose necessary to effect it, the office must be performed by the practitioner. If consigned to other hands, it is more than probable that half the medicine will never reach the stomach.

The treatment which stands next in importance to bleeding, is that by active purging. Bleeding, though the most important remedy during the paroxysm, subsequently becomes subordinate to purging; the first affords temporary, the second permanent relief, and we cannot speak too highly in its praise. When, from any cause, deglutition is impeded, calomel and croton oil are almost the only purgatives that can be given by the mouth; suitable doses may be placed on the tongue, and two or three drops of croton oil rubbed over the abdomen. Injections of turpentine, colocynth, or senna, can also be employed.

Medicines which stimulate the uterus (already too tense) are, for the most part, inadmissible. The ergot of rye has been much eulogised in the treatment of convulsions, both by American and English practitioners, especially by the former. The accounts on record, of the diseased rye in bread having absolutely produced convulsions, must not be overlooked; and similar effects are said to have followed the use of camphor, when exhibited in large doses. I am not aware of any valid objection which can be urged against the administration of ergot, provided the uterus and external parts have undergone their requisite degree of relaxation. Under contrary circumstances, no practice short of the passage of the hand could be more hurtful. Assuming that no objection of this kind exists, that the convulsions do not threaten immediate danger, and that it is expedient to promote delivery, a trial of ergot, with a view of obtaining its full effects, will be quite allowable. But supposing delay to be inadmissible, to trust to an uncertain measure, when the forceps can be applied, would be most injudicious: in which opinion Velpeau most fully concurs. Of the action of opium, in these states, I have had no experience; and the testimony of authors, respecting it, is most conflicting. Velpeau observes, that it neither merits all the good, nor all the ill, which has been said of it. In proportion as the circulation is either oppressed or excited, it will almost certainly prove injurious. If the determination to the head is not of an active character, or, in the words of Velpeau, unattended by stupor or stertor, and venesection has been pre-

mised, opium may possibly be beneficial. Indeed, a surgeon, in extensive country practice, assures me that, in convulsions which continued after delivery, he gave opium, with the best effects. After the violence of the disease is subdued, the countenance being pale, and the heat of the capillary system defective, opium, or rather a preparation of morphia, would seem a desirable medicine. Dr. Hamilton, who denounces opium, strongly advocates the employment of camphor in doses of ten grains: a remedy to which Burns and Chaussier are opposed. The first effect of a large dose of camphor, according to Dr. T. Thomson, is derived from its action as a local stimulant, and is subsequently followed by diminution of nervous energy. Its secondary effect is manifested by its excitement of the circulation; but whether it acts by absorption, or otherwise, does not appear. The tepid hip bath has been advised by Capuron and others, after general bleeding, in order to relax the uterus. If cold water were at the same time applied to the head and face, the practice might be useful, in rigid states of the uterine orifice. The head must be kept in an elevated position, the hair cut close, and the scalp refrigerated. For this purpose, ice (when it can be obtained) in solution, or pounded, and inclosed in a large bladder partially collapsed, seems highly appropriate. I have witnessed the most frightful convulsions, in infants, immediately arrested by this means, as well as by gradually pouring cold water from a short distance, and in a moderate stream, over the head and face. In puerperal convulsions, attended with much arterial

excitement, the same kind of affusion might be most beneficially employed. The patient should be brought over the edge of the bed, and the water poured over the head, as directed.

Great nicety is requisite in the use of a high degree of cold, which must not be resorted to indiscriminately, but proportioned to the urgency of the symptoms, the different states of the brain, and the effects produced. Dr. Graves, in his observations on convulsive diseases,* advises "that the stream of water should be small, not poured from a great height, and be discontinued the moment the fit ceases; to be again renewed on the appearance of another paroxysm." Between the paroxysms a spirituous evaporating lotion may be laid over the scalp. The application of cold to the abdomen has been suggested, but on no sufficient authority. Leeching the epigastrium, as strongly advised by Chaussier, appears far more rational. Counter-irritation, by means of blisters, seems well adapted to the more obstinate paroxysms, or to protracted states of coma. But great care should be exercised in the application of blisters, which I have seen productive of much mischief. Redness of the conjunctiva may be occasioned by the violence of the convulsive paroxysms; but if, in addition to this, the scalp be heated, or there be febrile re-action, blistering is most decidedly improper. When used, the blisters should be confined to the nape of the neck, and the course of the spine. Emetics have been strongly recommended, but I have had no experience of their efficacy. Miguel observes, that

* See Dublin Journal of Med. and Chem. Science, No. 2.

in exciting partial convulsions by emetics, we do not necessarily relieve the general convulsions, and they would appear to be altogether inadmissible, unless the stomach is suspected to contain indigestible food.

When convulsions do not speedily cease, I would endeavour to place the patient under the influence of mercury as rapidly as possible. Insensible as she may be to external objects, calomel suspended in a little thick gruel will usually be swallowed; but should this be impracticable, mercurial inunction, as well as other endermic treatment, is always within our power. I have heard of several cases of puerperal convulsions terminating successfully under a mercurial treatment; and the influence of mercury, in promoting the absorption of serum, cannot be denied. In one of the cases salivation was rapidly produced, and delivery did not occur before the full term of gestation. These then are the measures best calculated to subdue the disease; and whether the convulsions arise before delivery, or continue, or perhaps appear for the first time, after delivery, the general principles of treatment are the same In the latter case, the lochial discharge, when deficient, must be promoted by fomentations, leeching the vulva, and other approved means. Michell is an advocate for musk; and Dr. Copland speaks highly of glysters composed of turpentine, camphor, and valerian. Of these remedies my own experience does not enable me to offer an opinion. Several circumstances of minor import will claim our attention. A guard or plug of cork, if needful, should be placed between the molar teeth (to pre-

vent the tongue from being further wounded); the blood and mucus removed from the mouth, and the patient prevented from self-injury by the imposition of a very mild restraint. In a case, terminating fatally, to which I was called, the sufferer was so shockingly disfigured, as scarcely to be recognized by her husband.

A most important part of the subject remains to be considered. We will suppose that general treatment has failed in subduing the violence of the paroxysm, or preventing its recurrence. The question of delivery will then naturally arise; and, first, I shall record the opinions of our most esteemed authors on this subject, and then briefly advert to my own experience. Without doubt, artificial delivery has generally proved unsuccessful; a result mainly attributable to erroneous opinions respecting the immediate cause of the disease. By Mauriceau this practice was advocated, under the idea that the convulsions were occasioned by distension of the uterus: a most incorrect conclusion, the uterus not being distended at any time prior to the supervention of labour. Dr. Hunter, who appears to have considered all treatment as equally unsuccessful, observes that half his patients died whether they were delivered or not.* "That convulsions (observes Dr. Osborne) in general are dependent upon that state of the uterus which can be removed only by delivery, I am persuaded by repeated experience; and that no remedy can be used with any reasonable expectation of benefit, till delivery is completed; and that, therefore, it is our indispensable duty to

* MS. Lectures.

effect it in the quickest possible manner."* This unqualified practice is no less objectionable than the contrary extreme, as advocated by Dr. Bland, who discountenanced all interference of this kind. Hamilton is opposed to delivery, unless the forceps admit of easy application; and Leake (who speaks ambiguously respecting the seat of the disease, referring it either to the brain, stomach, or uterus) is very judicious in his directions. He advises delivery only when the os uteri is lax, and other means have failed, observing "it will admit of many exceptions, and ought to be regarded with caution."† According to Dr. Denman, it appears that a greater proportion of deaths succeeded artificial delivery, than when the cases were committed to nature; and Dewees very truly affirms, that the importance of delivery has been greatly over-rated. Michell, a strong advocate for delivery, seems to ground his opinion on the alleged fact, that convulsions cease during uterine action; a statement acquiesced in by Levret and Velpeau, and which my own observation has confirmed. But this cannot be admitted as a rule of practice; for in some instances the convulsion either produces an active state of uterine contraction, or returns simultaneously with each pain; the spasm being renewed by any attempt to pass the hand. That convulsions may arise in opposite states of the uterus, *i. e.* either during strong labour pain, or in the intervals, can scarcely be questioned. Under no other supposition can we reconcile the following contradictory statements of Dr. Denman: "The intervals between the convulsions evidently depend

* Essays, 62. † Pract. Obs. p. 333.

upon the action of the uterus, as will be proved merely by the application of the hand to the abdomen." And again: "The danger of cases attended with convulsions is not increased by their frequent returns, as these depend upon the frequency of the action of the uterus."*

I perfectly accord in opinion with Dr. F. H. Ramsbotham, that "convulsions neither suspend, nor interfere with, efficient uterine action," notwithstanding that the action of the uterus may arrest the convulsive paroxysm. During the insensibility which attends convulsions, although the sufferings of parturition are scarcely expressed by external signs, the process proceeds with vigour until the uterus has attained its highest degree of contraction. Indeed, the fact advanced by Baudelocque and others, that during the paroxysm the uterus has actually expelled its contents, although no action had previously existed, is a strong presumption in favour of delivery.† Under strong and frequently renewed paroxysms, an impression will almost certainly be made upon the os internum; a circumstance which evinces the necessity of an early examination, although there should be no indication of labour except the convulsion; for not only, as already mentioned, do the general convulsions act as labour pains, but cases are recorded of the uterus retaining the child

* Essays on the Puerperal Fever and Puerperal Convulsions, p. 68.

† The paroxysms, although differing from the natural parturient action, can only be regarded as modified labour; and, notwithstanding the insensibility of the patient, the uterine action will be obvious to the experienced practitioner.—It has been asserted that the contractions of the uterus are not attended with pain—an assertion at variance with daily observation.

by the violence of the convulsions producing breaches in its continuity, and forcing the organ through the pelvis, and also, in some instances, continuing its contractions and expelling the child after the death of the mother.* Although the attack may arise at any period, from the first reception of the ovum into the uterus, to its expulsion at the ninth month, it is rarely noticed prior to the sixth month of pregnancy. Antecedent to this period our practice is limited to general treatment, excepting, perhaps, the evacuation of the liquor amnii. In conformity to Capuron's suggestion, (previously mentioned by Denman and Lauverjat) if ordinary treatment has failed, and the os uteri be sufficiently relaxed, the membranes may be ruptured, under the impression that, by reducing the volume of the uterus, and permitting the blood to circulate more freely in the abdomen, the derivation will relieve the brain: the success of this measure will depend both upon the period of pregnancy, and the amount of liquor amnii. The possibility of turning being rendered more difficult, should it be found necessary, constitutes no valid objection against the measure. The greatest objection consists in the uncertainty when labour will ensue. From the sixth to the ninth month, delivery, when it is expedient, may be accomplished. But every objection which attaches to artificial delivery at the full term of utero-gestation, applies with peculiar force, if undertaken be-

* This statement derives some little countenance from the fact of the limbs of cholera patients having been observed to move after dissolution.—See my friend Mr. Rumsey's paper on the subject, in London Medical Gazette.

fore the term is completed, since the cervix uteri will not have undergone (except in rare cases) its full development.

The removal of eclampsia, when clearly originating in utero, or, in other words, arising after labour has commenced, will, in almost every case, depend upon the evacuation of the uterus. Desjardins did not lose one patient out of seven; Champion saved seven out of ten; and Velpeau concludes that all failures depend upon the brain having undergone a previous important alteration, the result of delay. But artificial delivery is not always a necessary proceeding; for when the pains are regular, the convulsions of the hysterical kind, and the patient sensible between each paroxysm, the case may be left to nature; if otherwise, we must interfere with promptitude. On the principle of the labour pains arresting the paroxysm, Lauverjat observes, "if convulsions persist, and there is only little or no dilatation, I insinuate the fingers between the womb and its membranes, to separate them as much as possible. We cause, in this manner, cessation of the convulsions, by the relaxation of the fibres of the womb." This is a very admirable mode of inducing premature labour, but I doubt its expediency in cases of eclampsia. The principle of forwarding the dilatation of the os internum by means of the fingers, can only be commended when the orifice is in a thin and yielding condition. Under contrary circumstances the practice cannot fail to be injurious.

Assuming that the neck of the womb is hard and undeveloped, that the symptoms are urgent, and that ordinary treatment has failed—what can be

done? Velpeau provides for such a case: following the suggestion of A. Paré, Van Swieten, Lauverjat, Dubois, Coutouly, Boden, and others, he recommends that one or more incisions should be made through the cervix uteri *(debridement)*; an operation said to be neither painful nor very formidable. But surely M. Velpeau is not in earnest, when he asserts that there are few first labours in which some equivalent lacerations are not produced. It has been termed, by Simpson and Lauverjat, the vaginal cæsarean section, and appears to have been performed several times with success. English practitioners will question the prudence of this measure; indeed, it is proscribed both by Mme. Lachapelle and M. Bouteilloux, on account of the extension which the wound is likely to undergo in the delivery; and Baudelocque says, it can only be the fruit of a moment of delirium. I am far from believing that nothing can justify its adoption, since it may be called for in malformed and schirrhous states of the womb; and it is only within the last few days that I was consulted on a case of the latter description, which almost seemed to require it. But simple constriction of the cervix uteri may surely be overcome by ordinary measures, and without employing force. According to M. Dubois, the operation is simplicity itself. "Even laceration of this part," said M. Dubois, "is not of itself dangerous, and only becomes so when complicated with, or preceded by, severe accident. The artificial division of the neck of the uterus is still less to be feared. A few months back, a woman, pregnant of twins, entered the *Maternité*; the labour had continued for many

hours, and the head, which had descended into the cavity of the pelvis, was closely embraced by the neck, which was rigid and showed no tendency to dilate. In this case I divided the neck of the uterus. The operation, which was extremely simple and easy, gave rise to uterine contraction, and the woman was delivered, without accident, in five minutes after. A similar case presented itself at the same establishment a few days ago. M. Dubois found it necessary to divide the neck, upon which the labour proceeded in the most favourable manner. A great number of analogous cases are to be found in works upon midwifery; and, upon the whole, M. Dubois concluded, that division of the neck of the uterus is an operation in itself not dangerous, giving rise neither to hæmorrhage nor inflammation; but, at the same time, one to which the practitioner should never have recourse, without a perfect conviction of its necessity."*

It appears to me that the rupture of the membranes, at an early period, will usually answer the intention of this operation. Even admitting that the convulsions which arise previous to labour depend *primarily* upon the condition of the uterus, it is important to recollect that labour is rather an incidental than a necessary result. Moreover, whether delivery be effected artificially, or by the violence of the paroxysms, the convulsions may continue in full force, notwithstanding the evacuation of the uterus; possibly, indeed, the impression previously made upon the brain may be increased by the efforts necessarily employed in the delivery.

* Lancet for 10th May, 1834, p. 247.

In numerous instances death has speedily followed artificial delivery; in others, the event has not been so immediately fatal. In an instance of very recent occurrence, the comatose state in which the patient died, did not take place for many hours after her delivery; she was in the eighth month of pregnancy, and labour succeeded the artificial evacuation of the liquor amnii. Can the line of duty be clearly marked out? Supposing a formidable paroxysm to arise between the sixth and the ninth month, or at the full term, or during labour, frequently recurring, followed by coma, and resisting the most prompt and energetic treatment—are we to deliver, or not?

Mr. Symonds, in a communication, on the subject of convulsions, to a weekly periodical,* after detailing the particulars of four cases successfully treated—first, by depletion, cold to the head, blistering, the warm bath, and subsequently by antiphlogistics, and camphor and opium—concludes in the following words: "Instructed by my own experience, and fortified by the authority of such writers as Denman, Blundell, and Gooch, I should say with the latter, take care of the convulsions, and let the uterus take care of itself." In this, as a general principle, I quite concur; but many exceptions to it may arise. When the attack appears during actual labour, our line of practice is clearly defined; we must abstract blood, evacuate the bowels by means of an injection, and deliver on the first favourable moment. But should the convulsions precede labour, the practice pursued by Dr. Joseph Clarke (very similar to that recommended by La

* Lancet for 8th February, 1834.

Motte) is the most rational that can be followed, viz. to trust to nature's efforts until the patient's life appeared to be endangered by the continuance of the disease, and then to interfere in the speediest and safest manner to effect delivery. The circumstances which justify interference demand an impartial and dispassionate consideration, and should embrace the state of the uterus, the presentation of the fœtus, the period of gestation, and the violence of the symptoms. An apprehension lest the patient may die undelivered, is a most powerful incentive for undertaking delivery, at any risk; and, certainly, the interests of the mother alone ought to decide so momentous a question. Indeed, under severe and frequent paroxysms the child rarely survives.* Of 43 cases, including a twin birth, which occurred under Dr. F. H. Ramsbotham's observation, 21 infants were born alive, and 23 dead. The death of the child is considered, by this gentleman, to depend

* The cæsarean operation, *post mortem*, might be performed with *faint* hopes of success. To determine, instantly, upon the operation, (for delay is inadmissible) presupposes a promptitude and composure of mind to which few can lay claim; and since the preservation of the child, theologically considered, (involving the baptismal question) is viewed with opposite feelings by Protestants and Catholics, the consent of the nearest relative, or friend, is essential before it should be undertaken. A late practitioner of this town resorted to the operation, about twenty minutes after the mother's decease, against the inclination of the friends (Protestants); and although the operation failed, I heard the principle of it condemned. On the other hand, a friend of mine, on a recent occasion, was blamed by the husband of an Irish woman (a Catholic), who expired very suddenly, near the end of pregnancy for not resorting to it at the end of half an hour. It is clearly the practitioner's duty to suggest the measure.

rather upon a defective utero-placental circulation,* than upon direct pressure; but the result may be occasioned by either cause.

The want of success in delivering generally arises from one of two causes; the first—delivering too early, before the uterine orifice has undergone sufficient relaxation; the second—postponing the delivery until effusion has taken place. It may be laid down as an axiom, that manual and instrumental interference are, at the moment, calculated both to renew the paroxysm and render it more violent. Denman found the mechanical dilatation of the os uteri productive of these effects; and the best informed writers, including Chaussier, fully confirm his statement. Previous to delivery being attempted, sufficient relaxation of the uterine orifice must be obtained by bleeding, emollient enemata, and the application of opium to the abdomen, and belladonna or opium to the orifice, otherwise we incur the risk either of an apoplectic seizure, an effusion of serum, or a laceration of the uterus. This precaution refers less to the degree of dilatation of the os uteri, (for the orifice is not unfrequently more or less open for many days before labour) than to its actual softness, as well as the impression made upon it during the paroxysm. If this effect be material, though the violence of the paroxysm may be subdued by bleeding, the sooner delivery is accomplished the better. Although the uterine orifice often becomes relaxed sooner than we might *a priori* infer, we shall

* The fœtal circulation sustains a similar and equally fatal interruption, by the increasing contraction which follows the full effect of the ergot.

not deprive its fibres of all opposition; a moderate degree of resistance is, in every delivery, both to be expected and desired. But a forcible entry into the uterus must be discountenanced by every rational practitioner. Ashwell considers that we may always dilate the uterus with the fingers: a statement which I cannot assent to.

Delivery having been determined upon, the mode of accomplishing it, a point of vital importance, must next be considered. The success of this operation, like that of all others, will depend, in a great measure, upon the skill displayed in its performance. The objection to turning, abstractedly considered, may be forcibly urged in almost all cases of puerperal convulsions. Hamilton appears to discountenance it altogether. "In every instance," (he remarks) "it ought to be a rule to wait until the head of the child is sufficiently protruded, that the access may be easy to apply the forceps." Provided the membranes are entire, the os uteri very dilatable, and the head quite above the brim, turning may be performed with comparative ease, and with little risk. Under contrary circumstances the operation could not, for a moment, be contemplated.

The forceps are, in a great measure, limited in their application to cases in which the os uteri is open and relaxed, and the head engaged in the pelvic cavity; for, as M. Velpeau remarks, the application of the forceps at the brim of the pelvis is more embarrassing, and requires more time, than the operation of turning; and the objections he urges against turning, when the eclampsia arises from a spasmodic or diseased contraction of the

cervix, apply equally to the use of the forceps under similar states of the organ. But, provided all other things are favourable, the circumstance of the uterine orifice being only partially open, and the occiput at the brim of the pelvis, and near its centre, is not absolutely conclusive against the application of the forceps.

In determining upon the smallest degree of actual dilatation of the orifice which will permit a narrow-bladed pair of forceps being placed within the uterus, and over the face and occiput of the child, I think, if the orifice is thin, lax, disposed to dilate, and actually dilated three inches in diameter, and the patient offered no violent resistance, that the forceps might, in the absence of pain, be both safely and effectually applied. When once secured, the further dilatation of the orifice would be promoted by the very efforts of the uterus consequent upon their action; and should there be a deficiency of power in the uterus to aid the action of the forceps, still there is in all cases, both of spontaneous and artificial delivery, a certain degree of contraction of the fundus which is accompanied by more or less dilatation of the orifice. In a case of very strong convulsions, which arose under the circumstances just mentioned, the practitioner gently forwarded the dilatation by means of his fingers, and having applied the long forceps, (Levret's is the best) accomplished delivery without difficulty, and with a successful result.

The advantage of the forceps over turning, when the head is engaged in the brim, is too obvious to need comment; indeed, the restlessness and strug-

glings of the patient will oppose a powerful resistance to the introduction of the hand. If the fœtal head is so situated that the forceps or lever cannot be safely or effectively employed, Dr. Joseph Clarke recommends delivery by means of the perforator or crotchett, in preference to turning. Craniotomy was practised in six instances, and these cases did well. For this preference the following justification is assigned: "By looking into the cases of this disease on record, I observed that, where the operation of turning the child was employed to expedite delivery, the event in general has been less successful; probably owing to the great irritation excited by it." This inference must not be taken for granted; for, in effecting delivery either by turning, or the long French forceps, we do not necessarily incur so increased a risk, over cephalotomy, as will justify the destruction of the child. In careless and unskilful hands turning must, indeed, be highly dangerous, and the long forceps, a most destructive instrument; but our argument is based on the principles of science, and not on the abuse of treatment. When the head is entirely above the brim, perforation is our only resource; and a most dreadful resource it is.

Every means which auscultation and the hand afford, should be employed, with a view of ascertaining whether the fœtus is still living. If we can obtain no certain evidence on this point, we must be governed partly by the length of time the convulsions have continued, and also by their degree of intensity, but chiefly by the urgency of the symptoms in general; for, as Velpeau has well observed,

"in convulsions our chief aim is to serve the mother, the fœtus demands so much less care, since it often dies before we decide how to act." He candidly tells us, that in France it is not rare to see the mother sacrificed to the desire of saving the child. I need scarcely observe, that when the convulsions depend upon the highest degree of pelvic distortion, the question of the cæsarean operation will necessarily arise; but the chances of preserving the child's life will be very feeble, under the most favourable circumstances. Again, the attack may immediately succeed the birth of the child, previous to the removal of the placenta. In this case the placenta will most probably be soon expelled. The introduction of the hand should, if possible, be avoided, on account of the straining which it would occasion.

Convulsions in connexion with irritative fever arise from the decomposition of disrupted portions of the placenta. I have seen several such cases. The great object is to allay cerebral irritation.* Phlegmasia dolens is a frequent sequel of this species of convulsions. It may, perhaps, excite surprise that the fit should occur directly after delivery. This may be explained: for although there is then a greater degree of freedom in the circulation, there is a sudden change in the current of blood, and less blood is actually contained within the cranium. The ordinary feelings consequent upon the birth of a child will assist in producing the paroxysm. The paroxysm which immediately succeeds delivery, or within two or three hours after (when not connected with hæmorrhage) is sometimes referrible to

* The subject is treated at large in my work on Uterine Hæmorrhage.

congestion in the brain, but more frequently to neglected states of the bowels during the last weeks of gestation; occasionally it is owing to a piece of placenta remaining in utero. The first changes after delivery, however natural, appear instrumental in the production of the fit. Distentions of the bladder, according to La Motte and others, may occasion an attack; therefore the introduction of the catheter must not be neglected in all such cases of eclampsia. It may be supposed that, owing to the violent contraction of the abdominal muscles, the bladder will necessarily be emptied. It is partially so; but in a case of this kind, occurring after delivery, although the urine was largely discharged during the fits, there was still a material accumulation in the bladder.

Convulsions arising about the second day after delivery, are usually connected with the secretion of milk, and demand active depletion. Whenever the fit may appear, and however well the patient may seem to be on its ceasing, still a very vigilant watch should be imposed upon her for many days, and all means enforced to ensure tranquillity of the system. A woman, attended by a respectable surgeon of this place, who had merely indications of a fit during the labour, was suddenly seized with a paroxysm on the fourth night after delivery, and expired almost immediately. These general rules must be applied, by the practitioner, to the exigencies of each individual case.

As respects the treatment after delivery, it may be observed, that on the subsidence of a long protracted coma, sensibility can scarcely be restored

suddenly or permanently. We have now to contend with the delirium of mania from excessive re-action, rather than of fever, and a train of morbid actions as the result of the previous cerebral disturbance. Essentially needful as bleeding is, to prevent effusion, yet, if I am not greatly mistaken, the worst forms of delirium succeed large bleedings, and are the consequence of loss of blood. The grand object in the treatment is now to allay secondary nervous irritation; to restore the natural secretions by the mildest means; and to promote the secretion of milk by drawing the breasts as often as the patient's strength will permit. Though the presence of the child may be regarded with indifference, yet, as it may increase the excitement, the breasts had better be drawn by a properly qualified person. The lochia should be promoted, but purging must be avoided, and magnesia, or the mildest enemata, (broth for instance) used for keeping the bowels open. Effervescing draughts with soda in excess, and camphor and hyoscyamus in pills, are also useful. The apartment should be sprinkled with chlorides, and be well ventilated, and the discharges when offensive removed. The linen on the person and bed must be changed frequently; the face and head sponged; and the horizontal position strictly maintained, as the urine and fæces pass involuntarily. Besides the usual precautions, the bed should be additionally guarded by skins of leather. The diet should consist of milk and water, cold chicken broth, soda water, grapes, oranges, &c.

I shall conclude these observations by a reference to some of the cases upon which my opinion has

been formed. Many of these cases occurred in the practice of my friends; and, for the particulars of six of them, I am greatly indebted to my esteemed friend Mr. J. M. Coley, of Bridgnorth. Before detailing the cases, I may observe, that several instances might have been added of peculiar affections of the brain and nervous system, which appeared to have been co-existent with, and produced by, some corresponding morbid condition developed during the process of utero-gestation. The immediate cause of such phenomena was probably local or partial congestion in the brain, as its functions became perfectly restored after the uterus had expelled its contents. I subjoin only two such instances; the first is worthy of notice in consequence of the same condition of the system having produced convulsions in one labour, and amaurosis in another; and the second as tracing hemiplegia, both in its production and cure, to the state of the uterus.

Convulsions arising during pregnancy, and previous to labour.

Case 1.—The convulsions, which appeared in the eighth month of a first pregnancy, were so violent that I was induced to attempt delivery, but the attempt failed on account of the rigidity of the os uteri. The patient, a very stout and plethoric young woman, was now largely bled: the convulsions immediately ceased. I then directed calomel and jalap, and an aperient mixture. Recovery was perfect, and labour did not come on until the expiration of a month; and the convulsions did not then recur. Mr. Blount and Mr. Ryland both saw this case.

Case II.—In this case, in which the convulsions occurred at the seventh month, and continued, more or less, for several days, general and local bleeding were frequently performed, both on account of the convulsions and the tenderness of the abdomen. The convulsions ultimately ceased, and the patient was delivered some weeks afterwards, by her surgeon, Mr. Wright, of a living child. Notwithstanding the abdominal tenderness, stupor continued, more or less, during the whole period of the illness.

Case III.—The attack happened at the seventh month, and under large bleedings and other measures so far subsided, that labour pains came on, naturally, in the course of a few days, without any recurrence of convulsion.

Case IV.—In this case, which occurred about the sixth month of a first pregnancy, the convulsions were associated with hemiplegia. The muscles of the right side of the face were, at times, convulsed; the right angle of the mouth fell; and the pupil of the right eye was dilated The patient had difficulty in uttering certain words; the countenance was dull; the mind melancholy, and materially enfeebled. Labour ensued at the ninth month; on the termination of which the disease began gradually to subside, and in three weeks entirely left her. She perfectly recovered, and afterwards had a large family of children, without a recurrence of the disease.

Case V.—A poor woman, subject to convulsive fits, and the mother of several children, applied to me in the seventh month of her pregnancy, with an enlargement of one of the finger joints. She expressed a wish to be bled, on account of a violent

pain in the stomach of several days continuance: but before my pupil could see her, she was seized with convulsions, and had been bled largely by a neighbouring surgeon. Some hours after this she was bled again, to nearly ℥xl. and other curative means were used; nevertheless, the fits, frequently recurring, ended in stupor. The os uteri was found to be closed. She died in a fit, about thirty-six hours after the seizure.

Sectio cadaveris.—Abdomen—the uterus and its contents in a natural state; thorax—slight enlargement of the bicuspid valves of the heart; head—considerable effusion of limpid serum between the pia mater and arachnoid membrane, and an effusion of bloody serum in the ventricles, with adhesion of the membranes to the upper part of the spinal canal. I had not an opportunity of seeing this patient after the attack of convulsions. Ought not the membranes to have been ruptured?

Case VI.—Mrs. F. who resided five miles from Bridgnorth, naturally of a spare habit, had become rather plethoric during her third pregnancy. She complained, on Monday morning, the 15th of July, (being within six weeks of the full term of gestation) of sick head-ache, and went up stairs to lie on the bed. The servants soon heard a heavy fall, and, on entering the room, found her on the floor, struggling violently, quite insensible, and surrounded by blood, which proceeded from injuries received in falling and struggling; this was at ten o'clock a. m. I did not see her until two p. m.; she had then had three fits, and had vomited three times; was partially conscious, but quite unable either to speak, or grasp

my coat when I was tying up her arm; the pulse was rapid and very full. The countenance was flushed, except during the convulsion; and the os uteri sufficiently open to admit a finger. After taking away about ℥xvi. of blood a frightful convulsion ensued, which entirely deprived her of consciousness. I allowed the vein to bleed to about ℥xxx., applied cold to the head, and endeavoured, but in vain, to make her swallow some castor oil (the only medicine at hand). She was exceedingly restless, and lay moaning, partly crying, and frequently put her hand to her head. At four o'clock (the earliest moment the medicine could be obtained) I succeeded in giving her 8 grains of calomel and a drop of croton oil, administered a colocynth injection, and had twenty-four leeches applied to the temples. The convulsions followed each other in rapid succession; the breathing after each paroxysm became more stertorous, and the coma more profound. At five o'clock the vagina was greatly relaxed, and the os uteri easily admitted two fingers. As the case was assuming progressively a more alarming aspect, I requested a consultation. Mr. Blount arrived at eight o'clock, and acquiesced in the propriety of delivery: at this time three fingers could have passed the os uteri. Rather more than usual difficulty attended the passage of the hand into the uterus, otherwise delivery could not have been more easily or speedily accomplished. No fit came on during the delivery, but another most violent paroxysm ensued immediately afterwards, succeeded shortly by death. The infant survived.

Autopsy.—The body was examined twenty-four

hours after death. Serum had collected between the arachnoid and pia mater, and also from ℥ij. to ℥iij. in the ventricles. The brain was very firm and healthy. Query: When was the fluid secreted?

Case VII.—Mrs. ——, a healthy young woman of florid complexion, had reached the thirty-seventh or thirty-eighth week of her second pregnancy, when she was attacked with spasmodic pain in the stomach and œdema of the face, which continued a fortnight, at which period a fit of convulsion ensued, followed by several other fits in rapid succession. The first fit took place at three o'clock a. m. of Dec. 13, 1834, and her surgeon saw her at nine. She was in a state of profound coma; the countenance purple; the pulse slow and feeble; and the tongue protruded, and badly wounded. She was bled to ℥xvi. with immediate relief to the coma; but a high degree of excitement ensued, marked by delirium, violent gestures, and indecorous expressions; in which state I found her at eleven o'clock. In consequence of the convulsions recurring during my visit, venesection was repeated to ℥xxiv.; leeches were applied in considerable number to the temples and behind the ears; the hair was cut off, and the scalp refrigerated by suitable lotions. She was made to swallow 10 grains of calomel mixed in a teaspoonful of gruel; and an injection was administered, composed of croton oil and extract of colocynth in gruel. The stage of coma ensued, but terminated within the hour of the return of the excitement. About eight or nine o'clock in the evening labour occurred, and she was shortly delivered of a living child. Recovery was gradual, but quite perfect.

Convulsions arising during pregnancy, and terminating in delivery.

Case I.—This case, which was preceded by violent pains in the head, occurred at the seventh month; the countenance was almost purple, and the legs and thighs were greatly œdematous. Mr. Hudson bled largely, and applied leeches to the temples. The os uteri relaxing I ruptured the membranes, and the patient was soon delivered in a state of complete insensibility. Depletion was continued, and she perfectly recovered.

Case II.—I am allowed to refer to this case by the eminent practitioner to whom its management was committed. During the attack, which came on instantaneously, and whilst the patient was walking, the membranes suddenly gave way; she was bled, and the convulsions ceased; but as the coma became progressively more profound, turning was decided upon, and accomplished. The patient survived only an hour. A *post-mortem* examination was not permitted.

Case III.—In this instance (a twin case) the patient, a very corpulent and unwieldy person, was seized, five days before delivery, with a fit of convulsion, followed by acute pain in the head. The pulse was full and slow; and bleeding and purging produced great relief. The day before delivery the pain in the head returned, and again yielded to active purging. Half an hour after the birth of the first child she experienced another fit of convulsion, which continued a quarter of an hour, and was followed by two or three others, terminating in stupor and difficult respiration. Her surgeon again bled

her to ℥xviij. and I saw her immediately afterwards. A second child was soon expelled by the natural efforts; but death took place a few minutes after the removal of the placentæ. My earnest entreaties to be allowed to inspect the body were resisted.

Case IV.—A poor woman was seized, in the sixth month of pregnancy, with a fit of convulsion. The paroxysms recurred frequently during two days; at the close of the second of which, labour pains occurred, and she was delivered of twins. A great hæmorrhage, which attended the separation of the placenta, seemed materially to relieve the brain.

Case V.—Mr. Elkington's.—April 29th, 1832, Sunday, Mrs. ——, the mother of a family, a corpulent and unwieldy person, nearly at the full period of gestation, had been afflicted with pain either in the head, abdomen, or limbs, during the last few weeks; but she refused to be bled. This day, 29th of April, Mr. Elkington was called to her at five a. m. a fit of convulsion having just occurred; as she had become sensible he entreated her to be bled, but without effect. During his visit a second fit arose. He then bled her to ℥xxxv. At nine p. m. several fits having recurred, ℥xxx. of blood were abstracted, and leeches applied. From this time until the same hour the next morning (Monday) she was perfectly insensible, had experienced a number of fits, and never spoke during the whole period. From nine to three this day (Tuesday) she was in a comatose or apoplectic state, with stertorous breathing, but could be roused with some difficulty, and then complained of great weight and oppression of the head. V. S. was repeated to ℥xii. which afforded marked

relief. Calomel and jalap were prescribed, and also the cold affusion. Glysters also were administered. Tuesday, at five.—She is now quite sensible.

Wednesday.—Labour pains commenced this day, and terminated in the delivery of a dead child. No hæmorrhage followed, although it had been always most alarming in previous labours. She recovered after a severe attack of phlegmasia dolens.

I was called to this woman in her succeeding pregnancy. Three or four days before delivery the symptoms premonitory of convulsions were treated by leeching; the labour went on most favourably. But, five or six weeks afterwards, some embarrassment in respiration took place; from which she appeared to have nearly recovered, when a fit of convulsion suddenly came on, and terminated her existence.

Convulsions occurring during the dilatation of the os uteri.

Case 1.—In this instance, which occurred in the practice of Mr. Starkey, of West Bromwich, and to whom I am much indebted for the particulars, the convulsive paroxysm came on whilst the os uteri was undergoing dilatation. In consequence of the fits increasing in severity, delivery was effected by the perforator and crotchet, but the convulsions continued unabated. Within twelve hours she was bled largely three times; cold was applied to the head, leeches to the temples, and a blister to the nape of the neck. Immediately after the last bleeding a dose of croton oil was placed upon the tongue. It operated very speedily, and produced the greatest

relief. The bowels were loaded with scybala and disordered secretions. The case appeared to be so very hopeless that twice the patient was supposed to be dying. Recovery was perfect.

Case II.—The attack occurred during labour. The patient was copiously bled; the convulsions ceased, and she was very speedily and safely delivered by the natural pains.

Case III.—In all respects much the same as the last case. Result the same.

Case IV.—A case attended under similar circumstances, occurring in a lady of spare habit and active circulation. A large bleeding weakened, but did not altogether remove the convulsions. Delivery was then accomplished by means of the forceps, and the patient did well.

Case V.—In this case the convulsions continued after artificial delivery, but ceased under depletory measures.

Case VI.—Terminated in paralysis.

Case VII.—Mr. Coley's.—The convulsions arose in a woman of spare habit, and nervous temperament. It was a first labour, and proved very lingering. The paroxysms, followed by stupor, continued about twenty-four hours: bleeding failed to give relief. Delivery was accomplished as soon as the os uteri admitted of the application of the forceps, and the convulsions ceased shortly afterwards. This patient, in a subsequent accouchement, was attacked with complete amaurosis, which continued during the whole period of her labour. She was bled, while in labour, without any apparent benefit. Vision was gradually restored.

Convulsions arising after the full dilatation of the os uteri.

Case I.—After a general bleeding, the head being within reach of the forceps, delivery was immediately accomplished. Recovery was perfect.

Case II.—A convulsive paroxysm, which succeeded a violent hæmorrhage, yielded to a dose of opium. The patient was then safely delivered, without any return of the paroxysm.

Case III.—The lady who forms the subject of this case, and who became plethoric during her pregnancy, was seized with convulsions near the close of her labour; the head of the child pressed upon the perineum. After a copious bleeding, delivery was accomplished by the forceps, but so far from the symptoms being removed, the patient remained insensible at least twenty-four hours; nevertheless, she fully recovered under the antiphlogistic treatment. Shortly before the completion of the ninth month, in her succeeding pregnancy, she experienced decided premonitions of convulsion, especially muscæ volitantes and pain in the head. These symptoms disappeared after bleeding, and labour ensued without any return of convulsions.

Case IV.—Mr. Coley's.—Violent convulsions occurred after many hours of suffering, just as the uterine orifice had undergone its full dilatation. The patient was delivered by the forceps, and the convulsions immediately ceased. It was a first labour, and the face presented to the pubes. The child's head was large and firmly ossified.

Case V.—A lady had been ill with irregular pains forty-eight hours, after which time they became

suddenly very strong and violent, and in one hour the os uteri was fully developed. A considerable hæmorrhage and strong convulsions, alternating with coma, now took place. I applied the forceps as soon as possible, and extracted a living female child, the patient being quite unconscious the whole time. The convulsions and stupor continuing for twelve hours, I administered 2 grains of opium, soon after which they ceased, and at the end of two days she recovered her faculties, but had no recollection of her delivery, or of any event from the commencement of the convulsions.

Convulsions arising after the birth of the child, and before the expulsion of the placenta.

Case I.—The subject of this case died in a convulsion, which came on whilst her accoucheur was passing his hand into the uterus to remove the placenta. I was engaged in making counter pressure externally. The convulsion was very violent, and life was extinct in about a minute. A *post-mortem* examination was refused.

Case II.—A violent hæmorrhage followed a disruption of the placenta, arising from the unskilfulness of a midwife. Offensive discharges and violent uterine pain, attended with vomiting and a puffy state of the abdomen, terminated in occasional strong fits of convulsions and stupor. Death took place on the eleventh day. On a *post-mortem* examination, a layer of placenta was found adhering tenaciously to the fundus uteri. The viscera were nearly ex-sanguineous.

Case III.—After the birth of the child at the sixth

month, the placenta was left in utero, in consequence of the funis giving way. The practitioner made several unsuccessful attempts to pass his hand into the uterus. On the seventh day after delivery convulsions arose, which soon terminated in death. I did not see the patient during life. On examination *post mortem*, the intestines appeared partially and slightly agglutinated by lymph; the uterus in a healthy state, containing the entire placenta, somewhat decomposed, but wholly though slightly adherent to it. The brain was quite healthy.

The two cases last detailed, of cerebral irritation, the consequence of placental decomposition, are fully reported in pages 119 and 219 of my treatise on uterine hæmorrhage.

Convulsions arising after delivery.

Case I.—In this patient the convulsions appeared within forty-eight hours after delivery, and terminated in death. My friend Mr. Knowles, who opened the body, informs me that no morbid appearances were discovered, either in the head or abdomen, to account for the fatal event.

Case II.—Mr. Coley's.—This patient, in her sixth labour, had been previously ill for fourteen days with uterine pain, attended with partial discharges of liquor amnii. She was in a state of extreme emaciation. Two hours after delivery, upon rising up in bed, she was attacked with convulsions, which in a short time terminated in death. The child, a female, was still-born; and the head was so much distended by hydrocephalus internus, that it appeared nearly as large as that of a person ten years old.

Case III.—A lady of very sanguine temperament, whose diet (with a view of obtaining a large secretion of milk) had been too stimulating, was seized, after delivery, with very violent convulsions. Her state was altogether one of very imminent danger; but under a copious abstraction of blood from the temporal artery, active purgatives, and a strict antiphlogistic treatment, she fully recovered.

Case IV.—For the annexed case I am indebted to my late colleague, Mr. F. Ryland, who attended the patient in my absence.

Jan. 4.—Sarah Croton was delivered by a midwife, about noon, after a natural labour, and continued, apparently, in a favourable state till three, when she was seized with extreme pain in the head and a fit of convulsion, quickly succeeded by two more; and at five, when I was called to her, she had just experienced a fourth. She was insensible; the face flushed; the head very hot; the pulse strong and about 100; and saliva, tinged with blood, issued from her mouth. I opened a vein, but could not obtain more than 5 or 6 ounces of blood. This, however, afforded great relief. Seven a. m.—Within the last two hours she has experienced two more fits, both quite as severe as the others. Twenty ounces of blood were taken from the arm, the head shaved, a large blister applied, and a purgative mixture administered. After the bleeding the face had become paler, and at times she was partially conscious; yet she lay, for the most part, perfectly still, with the eyes wide open, and the breathing stertorous. Eight p. m.—Has had several fits since morning, and most of them violent. In the inter-

vals she lay in a comatose state, with stertorous breathing; but occasionally seemed conscious of what was passing around: the pulse still continued very strong. Twenty-four leeches were applied to the temple, and a stimulating clyster injected.

5th, nine a. m.—One fit only recurred during the night; the patient continued in a state of stupor, with occasional signs of sensibility, and expressions indicative of great pain in the head: the pulse was softer, and the face less flushed. Eight p. m.—She has had one fit during the day; bowels constipated. One drop of croton oil was prescribed every hour until evacuations were procured.

6th.—The patient was materially better this morning, two doses of croton oil having produced three copious evacuations. She was perfectly sensible, and free both from stupor and head-ache; thirst considerable; the lochial and lacteal secretions very trifling in quantity.

7th.—Better in every respect. No recurrence of fits.

11th.—The patient suffered from head-ache and sleeplessness during the night of the 9th, owing to the torpid action of the bowels. A brisk purgative quite removed the symptoms, and from this time she gradually regained her health.

Case v.—Elizabeth Roden, æt. 23, had become very plethoric during the latter months of pregnancy; but, with the exception of drowsiness, had not experienced any of the premonitory symptoms of convulsion. She was delivered at six p. m. June the 25th, of her first child, after a very natural and easy labour, and at nine was seized with a violent con-

vulsion which lasted ten minutes. Mr. Bindley saw her at half-past eleven; the fits had recurred several times. She was now partially sensible, but the stupor was considerable; presently the paroxysm returned; she rolled her head about, struggled, saliva issued from the mouth, the pulse was full but not frequent, the head hot, and the face flushed; the lochia were sparing, and the bowels constipated. Ordered leeches, cold to the head, and camphor and opium.

26th, eight a. m.—The fits have frequently recurred during the night. In the intervals between the attacks she lies in a state of coma, and has stertorous respiration. V. S. ad ℥xxv; head to be shaved, and cold cloths applied. Calomel, pulv. jalapæ, and the purging mixture, were ordered. Two p. m.—The convulsions continue; the teeth had become so firmly fixed, that it was found impractible to give her the medicine; pulse 100. The blood does not present an inflammatory crust. Cold to be continued. Seven p. m.—The convulsions have recurred. ℞ Olei crotonis gutt. viij.; spt. vini, ʒij.; aquæ cinnam. ℥ij. M. sumat ʒi.; 3 tiis horis donec alvus respt. Sinapisms to the feet.

29th, eight a. m.—A surprising quantity of dark green and very offensive fæculent matter has been discharged, including a multitude of ascarides. She became sensible, but unconscious of her illness; and did not even remember having been delivered. From this time, with very slight deviations, she gradually and completely recovered.

I have the minutes of a third case, which so intimately resembles the two foregoing, as to render a

minute detail quite unnecessary. I will only remark, that the patient was seized, a few hours after delivery, with formidable convulsions. A copious bleeding produced mitigation of the symptoms; but the most marked relief attended the action of a purgative. The quantity of fæculent matter discharged was almost incredible.

Case VI.—Mrs. Vincent, æt. 44, was delivered of her fourth child, at three p. m. on Wednesday, the 16th of January, 1834. Her habit is full, and she has suffered from constipation, vomiting, and sick head-ache, during her several pregnancies, but more especially during the last. She did not pass even a single day, and scarcely a single night, up to the last hour of pregnancy, without vomiting several times; and head-ache also occurred very frequently during the whole period. About the fourth month she had simple fever, and was bled; after which she suffered still more from pain in the head, spasmodic respiration and constipation. She entertained a strong prepossession that she should die from the labour, which was, however, safe and of short duration. In five or ten minutes after the expulsion of the placenta, she was seized with a violent fit of convulsion, which continued about two or three minutes, and was attended with purple complexion, and the strongest marks of congestion. A second fit occurred within the hour. On the subsidence of both these fits she recovered her senses, but soon afterwards became and remained perfectly unconscious; the fits recurring about every half hour, until five next morning; from which time, until nine she had only two. Twelve leeches were ap-

plied to the temples, and also blisters; and ammonia was exhibited internally.

I arrived at half-past ten on Thursday. Symptoms of insensibility; perfect coma; face flushed and hot, and covered with perspiration; pupils permanently contracted; conjunctiva in as thickened and injected a state as in ophthalmia; the breathing, which had been stertorous, was now tolerably tranquil; the pulse 150 to 160, and very small; the breasts were flaccid; the uterus large; lochia tolerably copious; and the urine passed involuntarily. Considering effusion to have taken place, I did not bleed generally again, but prescribed twenty leeches to the temples; and calomel, ℈ss. ol. croton gtt. i. in gruel, with an enema (oii) cum ext. colocynth co. ℥ss. I directed the hair to be cut off, and the freezing mixture to be applied to the head: ice was not to be obtained. Calomel gr. iv. 2dis horis. The leeches were repeated; and the blisters were dressed with ung. hydrargyri. Head to be raised. ℥x. or ℥xii. of high-coloured urine were drawn off by the catheter. The enema, with croton oil and colocynth, to be administered. In the course of the evening the bowels were freely acted upon; the motions dark and fœtid.

Friday.—Although occasionally confused, the senses were, in a great measure, restored, and she conversed with tranquillity. Pulse 120. Mist. sennæ comp. was ordered.

Saturday.—An unfavourable change had occurred. There was constant delirium, with a perpetual exclamation—"the world is to be destroyed." The pulse feeble and 140; the pupils were much less contracted than on Thursday; the tongue was

moist, and very sloughy where it had been bitten. A blister to the head had been already applied before my arrival; but it was soon taken off. Sponging the face; cleaning the lips and teeth; administering mist. efferves. with ext. hyoscyami gr. iv. and calomel gr. ij. h. s. constituted the treatment. After several days, in which little variation was observed, the case terminated fatally. A *post-mortem* examination was refused.

PATHOLOGICAL REMARKS

ON

SOME DISEASES OF THE BRAIN,

PARTICULARLY IN REFERENCE TO THE UNCERTAINTY OF DIAGNOSIS.

BY THOMAS JEFFREYS, M. D.

Liverpool.

If the application of self-knowledge be admitted to be useful in the common occurrences of life, surely there are no persons to whom its necessity is greater, than to those of the medical profession. We all know that if, in the outset of our career, the spark of enthusiasm is not fully lighted up, no attainment can be effected beyond the standard of mediocrity; and whatever is below it, trespasses strongly upon, and interferes so evidently with, conscientious happiness, that I envy not those who can sit down satisfied with having partially discharged their duty under such circumstances. It is under this impression, that I presume to offer the following few remarks to the readers of the Transactions of the Provincial Medical and Surgical Association; and this not so much on account of any novelty they may possess, as for the purpose of showing how

necessary it is to reflect upon, propose, digest, and compare facts, before we draw our final conclusions from them. Perhaps, however, I cannot more forcibly present these sentiments, than by recalling to your recollection the words of the sagacious, experienced, and venerable Radcliffe—a name handed down to us as imperishable, as being the founder of that splendid library for the promotion of learning, which, bearing his name, adorns the University of Oxford. His words are, "*cum juvenis eram, et in arte medicâ adhuc rudis, adversus unumquemque, morbum viginti ad minimum remedia possidebam; nunc vero postquam in usu medicinæ consensuerim, viginti et amplius morbos novi, quarum ne unum equidem remedium habeo.*" (See Gregory's *Conspectus, suis auditoribus,* page 60.) If such were the sentiments of that able, excellent, and learned Court physician, Radcliffe, and were, moreover, thought worthy of being recorded by the still more learned Professor Gregory, how unpresuming ought we all to feel; and there are, doubtless, many who not only do so feel, but who practice what those eminent men so strenuously impressed. I full well recollect, when I was partaking of Dr. Gregory's hospitality, so far back as the year 1795, that among other useful hints which I received from his eloquent admonitions, one was—the advantage to be derived from acquiring the habit of committing our thoughts to paper; when holding at the time, in his hand, a case just then received, elaborately drawn up, for his opinion and treatment, he said to me, "much, very much, of my time is occupied by consultations such as this; and I would earnestly urge every

student of medicine to keep the custom I have recommended steadily in view; for it is upon these occasions that I find the habit both advantageous and satisfactory." I certainly felt strongly the force of his remark, but was too deeply sensible of my own deficiency to anticipate, for a moment, that it would ever be my decision to adopt such a practice; although I have not, even now, forgotten, nor ever shall forget, the sincerity and the energy with which this valuable advice was given.

I now proceed to my more immediate object, which is, to show the great uncertainty which often accompanies those symptoms which are considered, by many acute practitioners, as certain diagnostics, in some diseases of the most formidable and fatal character.

Case 1.—In the early part of my life, when in practice in the environs of London, in the year 1798, a very striking instance of this uncertainty came under my observation. It was supposed to be a confirmed and hopeless case of hydrocephalus internus, and which was rendered the more probable from the parents having certainly lost *two* children before, of that disease; one at the age of 15, the other of 2 months; and even a third, still younger, which, it is more than probable, was carried off by the same complaint. The parents being themselves very intelligent people, traced the similarity of the symptoms to be so closely allied in this instance, to those in the preceding, that they waited, in full expectation, the fatal termination. They were very intimate friends of the late Dr. Babington, with whom I attended, and his sincere friendship for

them added anxiety to his zeal for the recovery of their child, an interesting little girl about 3 or 4 years old. Very vigorous treatment was adopted: local bleeding by leeches to the temples, brisk purging with calomel and scammony, the free and rapid recourse to mercury externally, and blisters to the head; nevertheless, he thought (and his opinion governed mine) that nothing could possibly save the child. He, however, availed himself of the opinion of the late Dr. Saunders, then Senior Physician of Guy's Hospital, who not only declined making any alteration in the plan of treatment, but seemed to think his sole business to be the delivering a funeral oration to the parents; and in this state the little patient was left to be watched by me, for little more was afterwards done. In twelve hours, however, the mercury which had been so freely used, began to act, and our little patient finally recovered, to the great joy of the parents, and to the surprise and gratification of Dr. Babington and myself. She afterwards became the wife of the present physician of that name; and I have much pleasure in quoting a correspondence I have just had with Dr. Babington, who has not only furnished me with some valuable and interesting facts respecting his lamented wife, but even allowed me thus to make use of them. He says, "Your patient, whom you justly represent as having been most interesting, was separated from me by death, in January, 1824. Her health had been much weakened by the hot climate of India, and a very severe confinement with her first child; but she lived to give birth to four other children; and had in some

measure rallied, when she became the subject of tubercular phthisis, which was developed in consequence of a casual cold, and ran rather a rapid course. There was no *post-mortem* examination of her remains. She was for many years liable to occasional pains in her head, and to a nervous sensation, which at times prevented her using her needle, or reading, or even playing from written or printed music. She described the sensation to be, as if the point of the needle, or the letters of the book, or notes of the music were advancing towards her eyes, and even touching them; and she found relief in having her temples, especially at the outer orbits, gently pressed. These pains and nervous feelings were rather a matter of remark than complaint. They were never to such a degree as to call for medical treatment. I have often heard my father mention the case, and can testify, on his authority, that neither Dr. Saunders nor himself had any hopes of a recovery."

The following additional facts were noted by the mother, at the time, and appear to me too important not to be recorded in her own words; for which, I hope no apology is requisite.

"On the 16th of May, 1798, Anna Mary was feverish at going to bed, but got up next morning, apparently in good health; about noon she became feverish again, with great heaviness of the head, and sickness after food; had a restless night, and continued much indisposed. Dr. Babington saw her on the Friday evening, and ordered a powder for the next morning, which was repeated on the Sunday morning. A leech was applied to each

temple that evening, and repeated on the Tuesday. The fever and heaviness continued, with great restlessness; and light appeared to be painful to her. On the Wednesday, Dr. Babington ordered her to be kept in a room very much darkened, and prescribed ointment to be rubbed on her stomach, belly, and thighs, and under her arms: two parcels were rubbed in during that day and night. She complained twice this day, when her eyes were opened, that she could not see; nor could she, for the four or five succeeding days, keep her eyes open for a moment; about the end of that time, the window curtains being partially undrawn, she complained of the light being too near her. On Thursday a blister was applied to her head, she took one powder; and by Saturday the other six parcels of the ointment were used. During the use of the ointment, the bottom of the belly became inflamed, and very hard, but when the rubbing was omitted, the swelling and hardness subsided. About the end of the month (May) she became confined in her body, and was ordered injections, which answered every purpose. She has taken no medicine since the 24th of May, except a powder, part of which she took on the 12th, and part on the 13th of June. At the worst period of the disease, though her faculties seemed in a great measure suspended, her reason did not appear deranged. At this time she frequently rejected the nourishment given to her; and sometimes took it with avidity. May 28th.—She began to take asses milk. The excessive restlessness and screaming when she awoke from her short sleeps, had gradually abated during the latter part

of the time the ointment was used. On Monday, the 4th of June, she first appeared faintly pleased with the attempts made to amuse her. From that time she has continued mending; and is now (June 17th) sufficiently recovered to sit in a chair to her meals, which she eats with a good appetite. Her dinner is usually fish, sometimes meat with vegetables and pudding; her drink porter.

"She continued in very good health till the month of March, 1799, when she again became rather inclined to fretfulness, grew heavy, and appeared to suffer pains in her eyes and her head, if she looked attentively at any thing. Her habit of body, likewise, became confined. All these complaints were removed by her taking two of the powders ordered by Dr. Babington."

Dr. Benj. Babington here adds a very important remark, that the three children who died were suckled by the mother, but not the three who survived, one of whom was the subject of this case; and in all these the precaution was used of applying a blister to their heads as soon as they were born.

The powders above alluded to, were scammony and calomel. This, I think, must be considered a very satisfactory instance of recovery, from a disease which has been thought, by some, incurable. Since this period, a similar treatment has been equally successful, in some one or two cases of hydrocephalus internus, in the course of my practice; but I am sorry to say, that I have adopted the same remedial means, in very many others, without the same happy result.

The late Dr. Brandreth, of this town, considered

hydrocephalus internus an incurable disease; and, in a conversation I had with him on this subject, told me, "that whenever a cure occurred, he considered the nature of the disease had been mistaken." I need scarcely observe, that with the impression on my mind of what I have now communicated, I could not, for a moment entertain the same opinion.

I now proceed to detail a few cases, to show the difficulty and doubt attendant on our diagnostics in other cerebral diseases, to which I have added the appearances in the *post-mortem* examinations.

Case II.—*Abscess of the brain.*—During my attendance as one of the physicians of the Liverpool workhouse and fever hospital, the following case came under my management. Ann Bayley, æt. 21, became my patient about Oct. the 10th, 1807, complaining of a train of dyspeptic symptoms, of which pyrosis was one of the most distressing; she had also a great pain of the head, but by no means so urgent as to confine her to the house. I prescribed an emetic, and columbo powders, which only afforded temporary relief. On Nov. 7th, I admitted her into one of the sick wards, when she was cupped, leeched, purged, and saline medicines, with camphor, were ordered; also, aloes, rhubarb, and calomel, at night; and different stomach bitters, and antispasmodics, were tried in their turn, together with the arsenical solution; and the head was covered with a cap blister. None, however, of these remedies afforded more than transient relief, on the contrary, the pain of the head became almost insufferable, though the calomel had affected her mouth: delirium speedily followed, and shortly put an end to her existence.

Autopsy.—The brain was carefully examined by Mr. Christian, at that time one of the surgeons of the establishment, when I noted down the following account of it: The vessels of the dura mater were more evident and turgid than ever I recollect to have seen them; and this congestion extended itself also to the pia mater, like a very subtle injection. There also appeared a greater degree of adhesion of the falciform process to the lateral lobes, than is generally observed; and on cutting into the anterior portion of the right lobe of the cerebrum, a large cavity presented itself, about the size of the palm of the hand, the surface of which was dark-coloured, ragged, and bore evident marks of ulceration; which, when closed, Mr. Christian supposed was about the size of a hen's egg.* This cavity, formed by the abscess, extended backwards, almost as far as the right ventricle. The ventricles themselves contained a much greater quantity of water than was natural; the vessels running on the septum lucidum, and the under side of the corpus callosum, were evident and large; as they were also upon the corpora striata. The plexus choroides was natural.

Remarks.—Although, from the above appearances, it was quite evident that no remedy could have subdued so formidable a disease within the cerebrum itself, yet I must own I deeply regret that more general and copious bleeding was not had recourse to; and, perhaps, also, continued purging, with neutral salts, saline medicines, and sudorifics, as they, probably, may have afforded a greater prospect of success, than stomach purgatives and bitters,

* The brain itself too, he thought unusually firm.

although the diagnostics scarcely led to such indications. The day previous to her death, the dilated pupil strongly indicated compression upon the brain, either from water, matter, or extravasation of blood; but as the pain was removed from the fore to the back part of the head, it afforded no satisfactory sign of the real seat of the disease, although, probably, that pain was occasioned by the great congestion which existed immediately below the occiput.

Case III.—*Ulcer in the brain.*—My intention in recording this case, is also to show how doubtful our diagnostics are in cerebral disease; how inefficient our remedies; and how certain is the fatal termination.

Mr. A——, a respectable, retired tradesman, about 54 years of age, had been a patient of mine during the preceding eight years, for various diseases, some of which were of a formidable nature; but they were always heightened by the imagination peculiar to hypochondriasis, and were accompanied by severe dyspeptic symptoms. On the 8th of April, 1826, he again consulted me for palpitation of the heart, vertigo, and an impetigenous affection of the skin, which were all relieved by the usual remedies, leaving only a great depression of spirits, and a distressing anxiety about his health, which continued, more or less, during the months of May and June. The month of July was also passed full of the same complaints and anxieties; which were always met and overcome by such remedies as the varied symptoms seemed to indicate. It was only from the middle to the latter end of this month that his memory was observed to falter; fancying, moreover, that his

children were deserting him. The apprehension, however, of his danger was so forcible on his mind, that he settled his worldly affairs, and sought that consolation which his Priest had it in his power to afford. Very active treatment was adopted, by bleeding, blistering, and a seton in the back of the neck, as though there had been the most clear diagnostics to direct them. Still I could not satisfactorily trace, by the symptoms, the extent of the mischief which afterwards proved to have been going on; yet I had a secret satisfaction in having used them. As all medical means appeared to have very little effect upon him, it was determined to try what a change of air and scene, together with a sea voyage from hence to Cumberland, would produce; and, on the 19th of August, he went, by the Whitehaven packet, to his son's residence in the vicinity of Workington. He not only bore the removal well, but appeared somewhat better for several days after his arrival. Early, however, in September, he became affected with stupor, torpor of his left leg and arm, eneuresis, and other symptoms of paralysis. Although he was reported to me to be more free from mental anxiety, or any ordinary affection of the head, than he had been for some time, I nevertheless urged, in my correspondence, the use of salines, stimulating purgatives, aided by blisters to the neck and spine, varied as symptoms seemed to indicate. He sunk, notwithstanding, under his multiplied sufferings, on the 11th of Feb. 1826.

Autopsy.—I am indebted to his son, the Rev. A. Abram, Catholic Priest of Netherton, near Ormskirk, for his ready acquiescence in furnishing me

with the following *post-mortem* examination. His acute and intelligent views prompted him to allow every facility to investigate the state of the brain, and the seat of the disease: a laudable feeling not less conspicuous than were his duties as a son. The examination was made by the late Mr. Litt, the surgeon who attended him, in the presence of Mr. Dickenson, a surgeon of Workington; and the following are nearly the words of the former gentleman:

Thorax.—Upon opening the thorax, the contents appeared generally very healthy, with the exception of the right lobe of the lungs, where there was a little adhesion of the pleura, which did not seem of recent date. The heart was rather small, in comparison to the pulmonary artery; but no disease presented itself in either.

Abdomen.—No disease appeared in this division of the examination, though all the viscera were loaded with fat, particularly the arch of the colon. There was also much adipose substance about the left kidney. The omentum adhered with unusual firmness to the region of the stomach.

Brain.—All the vessels of the brain were much distended, those of the dura mater and pia mater particularly so, but without adhesion. There was a large mass of disease in the right lobe of the brain, rising from the basis of the skull and pressing against the falx of the left lobe, appearing like a cancerous tumour, which must have existed a long time, and was undoubtedly the cause of all his complaints, and, finally, of his death.

Mr. Abram's verbal account to me further states, that "on cutting off the right lobe of the cerebrum,

a cavity was observed about the size and shape of a modern full-sized watch, the superior part of which was filled with coagulum, and the lower part ulcerated." The exact situation, therefore, of this ulcerated cavity, seems to have been in the posterior and inferior part of the cerebrum, close upon the falciform process and tentorium.

Remarks.—There are two observations made by Mr. Litt, which may be worthy of notice: the one, that the disease had the character of a cancerous tumour; and the other, that it had been of long duration: to the former, if it was so, the term ulcer may have been as appropriate; to the latter I would observe, that the expression is rather indefinite; for, in a disease of this nature, I consider one, two, or even three months rather a short than a long period, and I cannot suppose, for a moment, it had existed more than three months. My valued young friend, Dr. James L. Bardsley, of Manchester, very recently informed me that he had lately lost a patient from an ulcer in one of the lateral sinuses, in whom not the slightest diagnostic of cerebral disease led to such a suspicion. And that there is often such a discrepancy in the diagnostics of many equally formidable diseases, and the *post-mortem* examinations, I have not the smallest doubt; another very striking instance of which I proceed to lay before the Association.

Case IV.—*Cerebral disease.*—The next case I have to record, is where the diagnostics of cerebral disease were very strongly marked, and the appearances upon dissection scarcely adequate to explain them.

Mr. H. aged 59, a robust man, of very convi-

vial habits through life, and also subject to internal hæmorrhoids, until within the last two years, first consulted me, in conjunction with his family surgeon, Mr. Ashcroft, on the 11th of May, 1831. He informed me that for the previous four days he had had pain of his head, with vertigo, and confusion of thought; and that he had formerly had gout: his legs were œdematous, and had a purpurous rash upon them. Pulse 80, and intermittent; had frequent vomiting, and some pain of his bowels. Mr. Ashcroft had given him stomach bitters, and blue pill. I prescribed a colchicum, purgative draught, with infusion of columbo in a state of effervescence.

12th.—All his symptoms were alleviated, more or less; therefore the mixture was continued, and his blue pill resumed, together with the colchicum draught to be repeated the following morning.

13th.—Pulse 74, still intermitting; no vertigo; some confusion of memory; with numbness of his thighs; legs less swelled, though he had had only one stool from the draught. Continue the mixture and pill; repeat the draught, made stronger, tomorrow morning; apply a blister to the head.

14th.—His head became much more affected last night, when eight leeches were applied to the temples, and the blister has only just now been put on; his head is already relieved, but his memory is impaired, and the numbness of his thighs no better, but it even extends to his belly. Saline medicines, with antimony, were substituted; and more purging was ordered.

15th.—Pulse 85, and more full. Though he thought himself better, suddenly a sense of fulness

of the belly came on, with the dread and fear of death. He had had only one stool. Twenty-four ounces of blood were taken from the arm, and a still more powerful purgative ordered, which produced five stools; and on the 16th all his symptoms were better.

17th.—Pulse 74, and intermitting; still there was much numbness of the thigh and abdomen; for which a carminative fœtid medicine was advised to be occasionally taken, in addition to his saline mixture, and antimonial pill.

On the 18th his pulse was at 72, but still intermitting; his memory more imperfect; numbness increased; and he had had, what they called, another fit last night; and two stools. A cap blister was applied to the shaved head, which, on the 19th, irritated and discharged much, and also produced strangury, with some improvement to the numbness. Pulse 70; bowels open.

20th.—Better; a stimulating liniment was rubbed freely down the spine.

21st.—Is again greatly agitated, and fancies his belly is swelled, which is not the fact, though both that and his thighs are certainly more tender to the touch.

23rd.—Pulse 79, with three long intermissions; mind very irritable; with cramps of his belly, and soreness of his thighs; and he thinks, at times, that he is dying. Large doses of camphor and myrrh were given in substance, washed down with a mixture of compound spirit of lavender, compound æther, and peppermint water; also purgative pills of colocynth and croton oil, which acted most freely.

24th.—Better. Pulse 80.

25th.—Pulse 85, and intermitting; tongue coated; stomach flatulent, with softness of his thighs; bowels open. Omit his medicines, and substitute an effervescing bitter infusion, with compound powder of ipecacuanha.

27th.—No better; and the spasms of his belly and legs were very distressing; for which soap liniment, with laudanum and oil of amber, was ordered.

28th.—Pulse was 104, and every symptom aggravated. A warm bath was urged and used, but without any good effect.

29th and 30th.—Pulse again came down to 90 and 72, but the other symptoms were no better; and the idea of the bath being repeated causing great agitation, mustard fomentations were substituted.

June 1st.—Pulse again up at 100, and intermitting; tongue coated; eyes suffused; and he is garrulous. Return to his saline diaphoretic medicines.

On the 2nd he was again better.

3rd.—Pulse 100; tongue coated; mind vacant, gives no answers, but repeats questions asked, and has a constant spasmodic unmeaning motion of his hands; eyes fixed, and face rather flushed. An evaporating lotion was applied to the head, and mustard cataplasms to the feet, at seven p. m. Pulse 120. The vacancy and spasms soon left him, but returned again in about two hours. A cap blister was applied, and a mixture of camphor, tincture of columbo, and muriatic acid was ordered.

4th, eleven a. m.—Better; pulse from 84 to 90. At seven p. m.—Sweats much; tongue coated, and dark coloured; has had no stool. Use an injection.

5th, 6th, and 7th.—Symptoms vary, but no mate-

rial change. Pulse 90, and for the first time regular; belly bound, he was therefore purged.

8th.—Pulse again 80, and intermitting; tongue better, but still typhoid. Saline tonics, with ammonia and hyoscyamus, were ordered.

13th.—Pulse intermits at 72; tongue as before; complains of tightness of his hips, and always fancies his legs are crossed; memory very imperfect; nor can he either feel a pin with the fingers of his right hand, nor even grasp with the hand itself. To take infusion of mustard and horseradish, with ammoniated tincture of guaiacum.

16th.—Much the same. Apply twelve leeches to the temples; insert a seton in the back of the neck; and give a simple saline effervescing mixture.

17th.—Pulse 120; is labouring under great nervous irritability, shaking agitation, and convulsions from head to foot, which came on very suddenly, and lasted for twenty minutes, when, accidentally turning round upon his side, they as suddenly went off. Seton not to be yet disturbed.

Daily and accurate reports were taken from this period until the end of the month; but as they would only be a repetition of the varying symptoms, very similar to those already noted, I am induced to withhold them. It may, however, be well to add, that the treatment was always modified so as to subdue the irritability of the whole nervous system, and its cerebral origin; and also promptly to mitigate the most urgent symptoms: the pulse ranging from 72 to 110. On one day the spasms and convulsions would return; on another, swelling of the knees and legs: the mind often astray. Leeches were

occasionally applied. The tongue was one day white, another day brown; the fingers of both hands now and then cramped and contracted: in short, the whole nervous system was so shaken, that every symptom was indicative of some formidable cerebral disease, extending its sympathy throughout the whole range of the spinal canal. He lingered on, in this state of miserable existence, until the night of the 31st of July, when death relieved him from his sufferings.

Having obtained permission to examine *the head,* in the presence of a neighbour, the dissection of the brain was ably and accurately done by Mr. Gill, in the presence of Mr. Ashcroft and son, two of Mr. Gill's anatomical pupils, and myself; and the following are the notes which I committed to paper immediately upon my return home.

Autopsy.—On removing the skull cap, the glandulæ pachioni appeared larger than usual, and there was a more than ordinary flaccidity of the dura mater, over the anterior part of the left hemisphere of the cerebrum. The blood in the longitudinal sinus was very fluid, and more in quantity than is usually observed. The pia mater was beautifully gorged with venous blood, and had almost a livid hue. The convolutions of the brain were remarkably distinct, and, when the pia mater was removed, could be traced in every serpentine direction. The brain itself was more firm than ordinary; and the cortical, or cineritious part, could scarcely be distinguished from the medullary, having, altogether, a dark appearance.

The corpus callosum, septum lucidum, fornix,

pineal gland, tubera quadra-gemina, thalami nervorum opticorum, and corpora striata, were all in a natural state; but the plexus choroides was of a brown, instead of a florid colour, and quite of a *morbid appearance.* The ninth pair of nerves were distinctly visible, and also the pituitary gland and the sella turcica. The cerebellum was also more vascular than usual; and the arbor vitæ not very distinct, though sufficiently so to be evident to an experienced eye. There was no *ulcer* of the *brain,* no osseous tumour, nor any thing but the congestion and firmness of the brain that appeared to be connected with the symptoms and the patient's sufferings; consequently I can only refer the disease to his having experienced great anxiety of mind, brought on by repeated disappointment and mental mortification, acting upon a constitution much broken down by intemperate habits, to a degree to shake the vigour of the whole nervous system, and thus to lead to premature old age, and death itself.

I have thus endeavoured to lay before the Association a few practical facts, to illustrate the deficiency which often surrounds our acknowledged diagnostics, and fetters our positive prognostics, under very pressing and, oftentimes, trying circumstances. If I have failed to establish my position, or have heightened into importance points which, to some persons, may appear insignificant, I trust it will be imputed rather to mistaken zeal, than to any forwardness on my part to attempt that which, I am very confident, might have been better done by other hands.

T. P. Œt: 7.— Circumference of Right knee, 19 Inches
D° ..... Left knee 15 Inches
Circumference of Head 20 Inches

[illegible] CASE OF ENLARGED [illegible]

A CASE

OF

EXTREME ENLARGEMENT

OF THE

ARTICULAR EPIPHYSES OF THE LARGER JOINTS,

FROM RICKETS.

BY THOMAS BRAYNE, ESQ.

Surgeon, Banbury.

The following case of a disease of which very little is recorded, and still less is understood, will, I think, be perused with interest, as an example of a rare form of it, in a very extreme degree; though it may not be possible to found on it any more satisfactory explanations or suggestions for treatment, than those of which the profession is already possessed.

Banbury, May, 1834.

T. P. æt. 7.—The parents of the subject of the following history are both healthy, and in a respectable situation of life; and the mother relates that this boy was the sixth of her eight children. The rest are tolerably healthy, though I observe that they have all, more or less, marks of the strumous diathesis; and the mother is a very fair and delicate person.

For the first fortnight after birth, nothing peculiar was observed about the child, except that he always cried on awaking from sleep, for which no adequate cause could then be assigned. In a week or two subsequent, he was affected with a diarrhœa, of which she only recollects that the discharges were very copious and very green. About the same time, slight appearances of stiffness and enlargement were observed in the right elbow. The diarrhœa continued unabated, in spite of various remedies; and at seven months he began to waste in his limbs and body, the knees then becoming enlarged, and lastly the wrists and ancles, though the growth of the knees seemed to proceed in a treble proportion to that of the other joints. His mother continued to suckle him until he was three-quarters of a year old. The emaciation and deficiency of the ordinary development in general growth, had become very marked by the time he was fifteen months old, when the parents went to reside at a distance, in another county; but the change of air, &c. was not observed to produce any beneficial effect. The diarrhœa continued with little variation; and, after the first year, the secretions often looked bloody and curdled, sometimes passed off insensibly, and were always very offensive. The state of the urine was not observed, but the mother thinks that it did not present any remarkable character. A severe degree of prolapsus ani accompanied the diarrhœa for a long time; occasionally as much as four inches of the rectum descending, and remaining prolapsed for considerable periods. During the last year the purging has greatly decreased, and the stools have become more natural;

but the rectum still descends when the bowels act, though it soon retires again without any assistance. The abdomen did not become tumid until he was three years old; and she observed, that for some time after the diarrhœa began to abate, the discharges were even more offensive than before, so much so as to be almost intolerable.

The general aspect of the poor child, is that attempted to be conveyed by the accompanying sketch, which I took as he sat in his mother's lap. The knees and elbows are anchylosed nearly at right angles, so that he is constantly compelled to this posture, whether sitting or lying. His countenance is sallow and rather vacant; but there is often a sparkling in the eyes, and a quickness of attention, when he is addressed, as well as a pertinence in his answers, which show at once that he possesses and has acquired much mental power; and which is in nothing more manifest than by the most perfect resignation, and often by the recommendation of it to his younger brothers, when they are peevish and discontented. His skin is dry and unhealthy, and there are many small spots of a scaly eruption, like the psoriasis guttata of Willan, scattered over his forehead, neck, and shoulders. His voice is squeaking and discordant, as though uttered through a reed, with a peculiar, dry, sibilous tone, which gives one the idea that there is something imperfect in the vocal cartilages or membrane. There is, however, no external hardness or enlargement about the throat, either of the laryngeal cartilages or of the thyroid gland. The shoulders are rather high; the ribs compressed laterally; the sternum prominent;

and the extremity of the ensiform cartilage slightly everted. The abdomen is considerably tumefied. His appetite is generally rather voracious, and nothing seems to disagree with him; he is indulged with sweetmeats, for which he has a great predilection. His mother says, that his bowels now act only two or three times a day, and that the alvine secretions are, for the most part, natural. His hair is light, and the eye-brows and eye-lashes of a still paler colour. The anterior fontanelle is not yet quite closed; and the cranium measures, round the temples, one foot eight inches. The spine is weak, and curved backwards. The bones of the pelvis, and upper extremities of the thigh bones, present nothing unusual; the latter have the natural degree of curve in their bodies, but, in the view taken, the thighs are entirely concealed by the enlarged knees. The right knee measures one foot seven inches, in its greatest circumference, and is, as large as the head within one inch. The relative proportion of the articular end of each bone which enters into the composition of the joint, as well as the situation of the patella, can be discovered by careful examination, and they all seem enlarged in nearly the same degree. The surface feels hard and unyielding, and large veins ramify over it, adding to the dark red colour which the skin has acquired from long distension. The integuments of the interstices between the bones are very slightly œdematous. The left knee measures only one foot three inches in circumference. The elbow, wrist, and ancle joints, are also greatly enlarged, as the figure represents. The elbows are also so much anchylosed that all flexion

and extension are destroyed, so much so, that he can only reach his lips with the ends of the fingers of the left hand, and this with the greatest difficulty. The hands are only the size of those of a child of two years old, and the fingers are clumsy and ill formed.

The foregoing case presents some circumstances worthy of remark. In ordinary cases of this defective state of the organization of bone in infancy, the middle of the long bone is found to bend, rather than the articular extremities to become large and spongy. This is most frequently seen in the bones of the leg; and when the tendency to soften ceases, the new ossific solid, deposited to strengthen the curved limb, is always found on the concavity of the curve. In the subject of the present history, there seems either to have been no disposition to softening in the bodies of the bones of the extremities, or, from his crippled state, weight sufficient to bend them had never been placed upon them. The morbid process commenced so early, that it can hardly be said to have been preceded by any observed internal symptoms. Yet that the defective organization of the epiphyses was connected with some peculiar, but unknown, kind of derangement of the digestive and assimilative functions, is apparent from the reported state of the intestinal discharges. It is probable that, had they been minutely examined, they would have been found to contain, some at least, of the earthy constituents in which the bones were deficient. Such disorders of the digestive apparatus are present, I believe, in other instances of rickety children; at least, they have invariably been so in

all those, even of the slightest degree, which I have witnessed. In most of these, the enlargement of the ends, or the softening of the bodies of the bones, has been preceded and accompanied by a long continued disorder of the alimentary canal. Such symptoms have been generally supposed to depend upon enlargement of the mesenteric glands; a change, however, which, I must confess, I rather consider as one of the sequelæ, than the cause of the morbid irritation of the mucous lining of the digestive tube. These latter conditions, I should imagine, partake often of the nature of ramollisement, or, at least, lead to it; and it is probable that the spongy state of the articular ends of the bones, in such cases, is produced by some organic defect in the structure of the bone, similar in nature to that of the softening of other organs. To say that the alteration is produced only by an imperfection, or absence of the deposit of the earthy constituents of bone, is but a partial explanation. In the present case, the diseased actions being almost coeval with respiratory life, it is impossible to say whether there may not have been some inherent defect in the fœtal organization itself, from the very first actions of the nisus formativus. Reflection on the history of cases, in which more or less of a defective and irremedial condition of the bony frame has existed from the earliest infancy, has inclined me to draw such conclusions. It is not often, I believe, in this confirmed softening of bone, that any good can be effected by medical treatment; and, in the present case, it had long been obviously useless. In all other cases of similar tendency, I think it will

be acknowledged, that the most watchful attention to the state of, and the earliest correction of any deviation from proper actions in, the digestive system, should be the first object. The restoration of healthy secretions, and the preservation of them by unirritating and simple nutriment, together with such restorative measures as are not productive of excitement, constitute all which the present state of our knowledge will enable us to apply to such conditions of disease; the origin and exact nature of which seem as much out of our view and comprehension, as reparation, when they are far advanced, is out of our power.

PART IV.

Reports of Infirmaries.

ANNUAL

REPORT OF THE BIRMINGHAM INFIRMARY

FOR

DISEASES OF THE EYE.

BY R. MIDDLEMORE, ESQ.

One of the Medical Officers of the Birmingham Eye Infirmary, Lecturer on Diseases of the Eye, &c.

SIMPLE acute conjunctivitis, 236. Chronic conjunctivitis, 126. Acute conjunctivitis, with pustules on the conjunctiva, 105. Acute conjunctivitis, with pustule or ulcer of the cornea, 112. Acute conjunctivitis, with puriform secretion, 75. Purulent conjunctivitis of newly-born infants, 33. Irritable conjunctivitis, 36. Strumous conjunctivitis, 78. Pterygium, 9. *(a)* Corneitis, 24. Vascularity of the cornea, 10. *(b)* Opacity of the cornea, 123. *(c)* Staphyloma of the cornea, 13. Impaction of foreign bodies in the cornea, 23. Simple acute sclerotitis, 5. Rheumatic sclerotitis, 9. Affections of the membrane of the aqueous humor, 11. Simple acute iritis, with or without ulcer or opacity of the cornea, onyx, or hypopium, 59. Chronic iritis,

7. Syphilitic iritis, 3. Strumous iritis, 8. Arthritic iritis, 2. Prolapse of the iris, 7. Fungus from the iris, 2. *(d)* Cataract, 29. Dislocation of the lens, 11. Choroiditis, 4. Retinitis, 4. Glaucoma, 8. Hydrophthalmia, 1. Suppuration of the eye-ball, 4. Atrophy of the eye-ball, 4. Fungoid, and various anomalous tumours of the eye-ball, 2. *(e)* Amaurosis of various kinds and degrees, 110. *(f)* Diseases of the lachrymal caruncle and semilunar membrane, 4. Diseases of the lachrymal passages, 23. Epiphora, 10. Strabismus, 7. Tinea, 91. Lippitudo, 17. Hordeolum, 8. Ectropium, 2. Entropium, 6. Inflammation of the eye-lids, 13. Œdema of the eye-lids, 6. Ptosis, 5. Ulceration of the eye-lids, 8. Adhesion of the eye-lid to the globe, 4. Tumours in the eye-lids, 28. Wounds of the eye-ball and its appendages, 39.

Development of the cornea.

(a) When the cornea is small from birth, it usually happens that the other parts of the eye exist in a correspondently diminished size. This defect I have often witnessed; and since the publication of my last Report, I have also seen two instances in which the cornea was scarcely at all developed, the other parts of the eye being apparently perfectly formed. I have also seen two examples of undue development of the cornea. The first of these examples is thus referred to in my printed Introductory Lecture: "I have lately seen a young man from Bloxwich, suffering from a most extraordinary development of the left cornea; though retaining the most perfect transparency, it is increased to nearly

treble its natural size; the iris has augmented in a corresponding degree, so that the anterior chamber is amazingly ample. The other parts of the eye are not at all enlarged. But the fact to which I am desirous of directing your particular attention, is the occurrence of the same disease in the opposite cornea. When I first saw this person, the right cornea was not at all enlarged, but it is now evidently increasing, and will soon, I fear, become as large as the other, at least, unless something be done to prevent it."

In the second example, the disease occurred after small-pox, in an infant, a patient of my friend Mr. Palmer, who requested me to see the case. The right eye is quite healthy. The cornea of the left eye is much increased in extent, its diameter being at least twice as great as that of the opposite cornea. Its texture is apparently healthy, and quite transparent; the anterior chamber is very ample, and the iris is placed at a considerable distance from the neural surface of the cornea. The humours of the eye are somewhat cloudy. If the left cornea continues to increase in size, and if a morbidly increased development occur in the opposite cornea, and which the use of iodine and mercury, and the employment of counter-irritation, should fail to arrest, I shall recommend, *from experience of its utility* in such cases, the removal of a central portion of the much enlarged cornea, as a means of preventing the loss of vision in the eye last affected. This is the only mode of destroying the sympathy which exists between these parts under this condition of disease, with which I am acquainted.

Opacity of the cornea.

(b) Opacity of the cornea is rarely a result of ophthalmic inflammation, when properly treated, and when the case is seen at a sufficiently early period to permit the due influence of remedies. The frequency with which this product of disease takes place, satisfactorily proves that the previous affection is often either much neglected by patients, or inefficiently treated by the practitioner.

I do not mean to prolong this Report, by pointing out the various characters, and the different seat of what is phrased "opacity of the cornea;" but I am desirous of stating some circumstances connected with its history, which I do not remember to have seen sufficiently explained in the works of any of the numerous authors, who have so successfully devoted their attention to the pathology of the organ of vision.

When the clearness of the cornea is slightly impaired by the existence of chemosis around its margin, the secretion from the cellular web, which connects together its lamellæ, becomes turgid; and if the original malady continue, interlamellar lymphatic deposition takes place, and, presuming that the prior affection is then remedied, the cornea remains opaque; there remains, in fact, a slight form of diffused onyx. After some severe fevers, and in that prostrate condition of the system which is produced by the malignant cholera, or which remains after copious hæmorrhages, a similar state of things has been remarked; and it will be remembered, that it is a preliminary state to the sloughing of the cornea and suppuration of the eye-ball, when the nutrition

of the globe has been interfered with by the division of the fifth pair of nerves.

I do not intend to pursue the inquiry further on the present occasion; but I am most desirous to mention, that in many of those instances in which this diffused interlamellar deposition exists, the transparency of the cornea is entirely restored by the adoption of very simple measures. The opaque substance is gradually removed; and if no injury be done to deeper-seated parts, the integrity of that organ is perfectly restored. But should the cause which originated the interlamellar deposition continue in operation, ulceration, staphyloma, or sloughing of the cornea, may be expected to occur. For, in the first place, it will be remembered that the nutrition of the major part of the corneal lamella takes place through the medium of the connecting cellular membrane, and that its vitality may be affected, if it be sufficiently inflamed to give rise to much lymphatic deposition; in the second place, it will be remarked, that the pressure of the deposited matter will induce the absorption of the lamellar texture, and will mechanically impede its nutrition, so that in the former case, ulceration, abscess, or staphyloma of the cornea may result; and, in the latter, gangrene and sloughing of that membrane, may occur.

If a thin layer of inflammatory (lymphatic) deposition exist between the corneal lamellæ, it will produce a dirty bluish-white appearance, such as is often witnessed in the light form of *opacity of the cornea;* and it is to this condition of disease that the following plan of treatment is more particularly

adapted. Let a camel hair pencil be dipped in a solution of the sulphate of cadmium (one grain to two ounces of distilled water) and applied to the cloudy part of the cornea three or four times a day.

This application produces very little uneasiness; and I have not observed that it inflames the eye, or produces any of those unpleasant effects which sometimes follow the use of the oxymuriate drops. I do not usually advise the solution to be used until the cornea is *entirely* removed: and I think it unnecessary to continue its use after indications of its *commencing* disappearance are unequivocally manifest.

Of course, when an opacity of the cornea results from loss of its lamellar texture, the preceding method of treatment is not likely to be serviceable, except inasmuch as it may cause the removal of a sort of halo, or slight nebula, which surrounds the dense leucoma.

The treatment of opacity of the cornea by the insufflation of calomel, &c which has been stated to have been so successfully adopted by Le Pelletier, Dupuytren, Sanson, and other celebrated French surgeons, has not succeeded in my own practice. In fact, the inflammation excited by the insufflation, tends to augment the malady; for it must never be forgotten, that when a small opacity of the cornea is present, every slight attack of ophthalmia is liable to increase its size; even a degree of inflammation which would be inadequate to give rise to lymphatic deposition in any part of the cornea, if none previously existed.

A weak solution of the oxymuriate of mercury is

a favourite and very common remedy for the cure of opacity of the cornea, and there can be no doubt respecting its efficiency, but it produces a good deal of pain, and when employed too soon, or is injudiciously continued, it is prone to recall the inflammation, the effects of which it is employed to remove.

Staphyloma.

(c) George Rhodes, æt. 2, has a very large globular staphyloma of the right eye, consequent on purulent ophthalmia. The surface of the tumour is round, smooth, and very vascular; the eye-ball is much enlarged, but is not the seat of much pain and irritation. The eye has been tapped on several occasions, and various remedies have been tried, but fruitlessly tried, with the intention of checking its growth.

Operation.—I removed a portion of the staphylomatous projection (with Beer's knife and the hooked forceps) rather less in extent than the cornea in its natural state.

Treatment.—A roller was passed round the eye after the operation, and the nurse was directed to keep that part of it which covered the eye wet with cold water. The child to have a little of the syrup of poppies.

Result of the case.—A good deal of swelling of the lids, and tension of the globe, occurred a few days after the operation; but they soon subsided, and the eye-ball is now reduced to its ordinary size.

I have made a preparation of that portion of diseased cornea I excised, and it very well displays the usual circumstances which constitute the patho-

logy of staphyloma of that texture. The cornea is enormously thickened, and is very vascular; the vessels which lead to its organization pass through it irregularly, without any definite arrangement; some of them shoot through its entire texture; but the major part of them ramify as a dense net-work upon, and immediately beneath, its surface. Its lamellar arrangement is totally destroyed; so that its layers are consolidated and cannot be moved upon each other, as in their normal condition. The iris is firmly adherent to the neural surface of the cornea, it is intimately connected, almost identified, with it, and is torn or separated so as to possess a reticulated appearance, in consequence of the extension of that texture to which it was attached before it became materially increased in extent.

It will be observed, that in the preceding case the eye-ball acquired an enormous size before it gave rise to much irritation; and this, it will be noticed, is usually the case, when the disease consists of what is termed the *globular* variety of staphyloma. The *whole surface* of the projection then sustains the friction of the eye-lid, not merely its *point*, as in the case of *conical* staphyloma; and hence it happens that the globular staphyloma not only excites less irritation, but acquires a much greater magnitude than its conical variety ever attains. I have previously pointed out the various other circumstances connected with the history of staphyloma, and therefore need not repeat them; but I cannot avoid expressing my firm conviction, that had I adopted the usual mode of removing this large staphyloma by excising a great part of its anterior surface,

very severe symptoms would have resulted. The disease is cured, not by the mere diminution produced by, and in correspondence with, the size of the part removed, but by the occurrence of atrophy as a consequence of the operation. The principle, therefore, to be kept in view, in the adoption of our remedial measures, is the production of atrophy without the extensive removal of parts by a surgical operation.

Cataract.

(d) I shall briefly describe my usual plan of operating upon children from one to three years old, suffering from complete congenital cataract. I have the pupil fully dilated by the use of a strong solution of hyoscyamus; the child's body securely enveloped in a napkin, with the arms fixed to the sides; and the child placed upon a table of a convenient height, with the head slightly raised. The head is firmly fixed by an assistant, by pressing the hands on either side of it. If operating upon the right eye, I raise the upper lid and steady the eye-ball *(not by means of a speculum)* by pressing the index finger upon the temporal, and the middle finger upon the nasal side of it. I then *rapidly* pass a very fine needle* through the cornea, near to its junction with the sclerotica, and simply lacerate the capsule by slightly moving its point a little backwards, and to either side.

* The needle should be very fine and slender, sharp *at* the point, a little flattened *towards* the point, having a cutting edge on either side for a short distance *from* the point, and gradually becoming round towards the handle.

The advantages of this mode of operating are neither few nor unimportant. In the first place, it is quite efficacious, quite competent to the removal of the disease, or, at most, only requires to be performed a second time; secondly, when properly performed, it involves no risk of injuring any important texture, except the cornea; thirdly, it gives rise to scarcely any pain; and fourthly, it excites hardly an appreciable amount of inflammation.

The use of the speculum is exceedingly painful and very injurious, for its pressure gives rise to more suffering and inflammation than even the puncture of the coats of the eye. This operation and its effects, as now described, have been frequently witnessed by many of my professional friends, and I am privileged to say, that their opinion of it is quite as favourable as mine.

Amaurosis.

(e) The experience of every year, strengthens my conviction of the value of strychnia in the management of certain defective states of vision; and I would earnestly entreat my professional brethren to form their estimation of its powers, not by any vague condemnation it may have received from those who have either not taken the trouble to test its efficacy, or to select proper cases for its application, or to employ it cautiously and judiciously, but by their own experience, and from their own observation.

When loss or serious impairment of vision exists, and is associated, as an effect, with certain pathological states of the system, or of the eye, or of both

combined, (I have referred to many of these in my published remarks upon this subject) the local application of strychnia will sometimes be extremely serviceable, when all other means have been fruitlessly employed.

My opinions upon this subject have been derived from years of laborious and, I may say, extensive observation; and I am satisfied, that if those who have censured the practice will labour in the same way, they will meet with the same result, and will be prepared to recognise, in this excellent remedy, a means of rescuing many of their fellow beings from a state of blindness. But it will be understood that, in order that benefit may be obtained, a little judgment and discrimination must be exercised in selecting appropriate cases for its use; and I mention this the more particularly, because I, in common with other members of the Provincial Association, must be aware that many cases which have recently been published in various Medical Journals, were quite unsuited to the application of the remedy; and, indeed, some of them were evidently rendered worse by its employment.*

Acute inflammation of the semilunar membrane and lachrymal caruncle.

(f) A girl about twelve years old came to the infirmary, with a very considerable enlargement of the semilunar membrane and lachrymal caruncle. The enlarged parts were very red, but scarcely at all painful. She could give no account of the

* A good and elaborate monograph on the therapeutic influence of strychnia is much wanted.

cause and progress of the complaint, which was, however, soon removed by the application of leeches near the inner canthus, and by free and frequently repeated scarification. As this young person was recovering, her sister applied to me with a precisely similar condition of disease, which, it appeared, had existed for about a month; during which time she had, with the approbation of her medical attendant, been under the care of a cobbler of this town, who had put into her eye, every day, *a dark-coloured ointment*, with the assistance of a *knitting pin*. This case was also relieved by the plan of treatment which was so successfully employed for her sister. But it is somewhat remarkable (it may, perhaps, be a consequence of the improper treatment she underwent, combined with the longer duration of the disease) that the semilunar membrane and lachrymal caruncle remain in a state of enlargement, which, I apprehend, nothing short of a surgical operation will remove.

A REPORT OF THE OUT-CASES,

ATTENDED

BY GEORGE PARSONS, ESQ.

AT THE

BIRMINGHAM INFIRMARY,

FROM JANUARY 1, TO DECEMBER 31, 1834.

	Qr. ending March 31.		Qr. ending June 30.		Qr. ending Sept. 30.		Qr. ending Dec. 31.		TOTAL.	
	CASES	DIED.	CASES	DIED.	CASES	DIED.	CASES	DIED.	CASES	DIED.
Abortus	3	...	1	...	...	...	7	...	11	...
Abscessus	20	...	22	...	15	...	22	...	79	...
Abscessus psoatic	...	...	1	...	...	...	...	...	1	...
Amenorrhœa	11	...	11	...	13	...	10	...	45	...
Anasarca	3	...	2	1	3	1	2	...	10	2
Aphthæ	...	...	2	...	2	...	1	...	5	...
Apoplexia	1	1	1	1	...	...	2	...	4	2
Ascites	...	...	1	...	...	...	1	...	2	...
Asthenia	21	...	19	...	22	...	17	...	79	...
Bronchitis, acut.	3	2	2	1	2	...	1	1	8	4
Bronchitis, chronic	81	8	40	1	24	1	57	4	202	14
Calculus vesicæ	1	...	...	...	...	...	...	...	1	...
Carcinoma	1	...	1	1	...	...	...	...	2	1
Catarrhus	102	...	75	...	59	...	87	...	323	...
Catarrhus epidem.	...	...	41	...	...	...	...	...	41	...
Cephalœa	20	...	18	...	16	...	19	...	73	...
Cholera biliosa	...	...	...	...	31	...	4	...	35	...
Chorea St. Viti	1	...	2	...	1	...	...	...	4	...
Colica pictonum	1	...	1	...	...	...	...	...	2	...
Constipatio	28	...	27	...	22	1	16	1	93	2
Convulsiones (Inf.)	5	...	2	1	2	...	4	...	13	1
Cynanche tonsill.	7	...	14	...	11	...	15	...	47	...
Dentitio	2	...	11	...	5	...	2	...	20	...
Diarrhœa	26	...	21	...	106	4	44	...	197	4
Dislocatio	1	...	...	...	...	...	...	...	1	...
Dyspepsia	49	...	53	...	67	...	47	...	216	...
Dysuria	3	...	8	...	1	...	7	...	19	...
Epilepsia	3	...	5	...	7	...	1	...	16	...
Erysipelas	6	...	9	1	4	1	5	1	24	3
Erythema margin	...	...	1	1	...	...	...	...	1	1
Erythema nodos	5	...	5	...	2	...	...	...	12	...
Febris intermit.	2	...	...	...	...	...	...	...	2	...
Febris remit. inft.	4	...	9	...	6	...	...	...	19	...
Fistula in perineo	...	...	...	...	...	...	1	...	1	...
Fracturæ	6	...	4	...	7	1	3	1	20	2
Gangræna	1	1	...	...	1	1	...	...	2	2
Gonorrhœa	24	...	26	...	29	...	32	...	111	...
Hæmoptöe	5	...	1	...	2	...	3	...	11	...
Hæmorrhœa petech	...	...	...	...	...	...	1	...	1	...
Hepatitis	...	...	...	...	...	...	1	...	1	...
Hæmorrhoides	8	...	6	...	7	...	4	...	25	...
Hernia	2	...	3	...	4	...	...	...	9	...
Hernia humoralis	2	...	4	...	1	...	3	...	10	...

	Qr. ending March 31.		Qr. ending June 30.		Qr. ending Sept. 30.		Qr. ending Dec. 31.		TOTAL.	
	CASES	DIED.	CASES	DIED.	CASES	DIED.	CASES	DIED.	CASES	DIED.
Herpes Zoster	...	...	4	...	3	...	2	...	9	...
Hydrocephalus, ac.	1	1	...	...	...	...	1	1	2	2
Hydrocephalus, chr.	1	...	...	...	...	...	...	...	1	...
Hysteria	1	...	9	...	4	...	1	...	15	...
Icterus	1	...	2	...	3	1	1	...	7	1
Incontinent. urinæ	...	...	1	...	1	...	...	...	2	.
Laryngitis acut.	...	...	2	1	...	...	1	...	3	1
Leucorrhœa	5	...	2	...	1	...	...	...	8	...
Lumbago	5	...	6	...	3	...	3	...	17	...
Mania	1	...	...	...	2	...	2	...	5	...
Mania puerper.	...	...	...	...	...	...	1	1	1	1
Marasmus	6	2	11	3	7	4	3	2	27	11
Menorrhœa	3	...	2	...	5	...	5	...	15	...
Neuralgia	6	...	1	...	5	...	...	...	12	...
Œdema	1	...	1	...	...	...	...	...	2	...
Ophthalmia	9	...	7	...	5	...	8	...	29	...
Paralysis	4	...	3	...	3	...	2	...	12	...
Pericarditis, acut.	1	1	...	...	...	...	...	...	1	1
Peritonitis, acut.	...	...	...	...	1	...	...	...	1	...
Pertussis	28	3	17	3	...	...	2	...	47	6
Phlebitis	...	...	...	...	...	...	1	...	1	...
Phlogosis	33	...	24	...	28	...	19	...	104	...
Phthisis pulmon.	14	12	8	8	11	9	6	4	39	33
Pleuralgia	14	...	7	...	11	...	11	...	43	...
Pleuritis	5	...	4	...	2	...	2	...	13	...
Pneumonia	4	2	3	...	1	...	2	...	10	2
Podagra	...	...	1	...	...	...	...	...	1	...
Polypus nasi	...	...	...	...	...	...	2	...	2	...
Porrigo	29	...	19	...	13	...	15	...	76	...
Prolapsus uteri	1	...	3	...	3	...	3	...	10	...
Psora	36	...	11	...	11	...	9	...	67	...
Psoriasis, Prurigo, & other diseases of the skin	8	...	4	...	6	...	6	...	24	...
Retentio urinæ	...	...	...	...	2	...	...	...	2	...
Rheumatismus ac.	18	...	15	...	4	...	22	...	59	...
Rheumatismus chr.	6	...	7	...	7	...	7	...	27	...
Rubeola	8	...	51	7	20	2	5	...	84	9
Scarlatina	3	...	19	1	26	3	10	...	58	4
Scirrhus	...	...	1	...	...	...	...	...	1	...
Sciatica	...	...	1	...	1	...	...	...	2	...
Scrofula	5	...	3	...	2	...	2	...	12	...
Strictura urethræ	1	...	1	...	...	...	1	...	3	...
Synochus	82	1	34	2	54	6	131	11	301	20
Syphilis	23	...	14	...	11	...	6	...	54	...
Ulcera	27	...	33	...	24	1	18	...	102	1
Urticaria	1	...	...	...	1	...	...	...	2	...
Variola	14	2	1	...	2	...	...	...	17	2
Variola post vac.	3	...	1	...	...	...	...	...	4	...
Vermes intestinales	16	...	10	...	12	...	13	...	51	...
Various cases of Burn, Wound, Sprain, &c.	34	...	42	...	39	...	44	...	159	...
Total	916	36	834	33	806	36	786	27	3342	132

In medical statistics, but little comparative value can or ought to be attached to results deduced from observations made during short periods of time, for the presence of unusual epidemics in particular years, like the influenza of 1833, and the more dangerous character occasionally assumed by the ordinary diseases of a country, must largely influence such results, and demand that the enquiries should be extended over a lengthened period, in order that undue importance may not be given to circumstances of extraordinary, rather than of ordinary, occurrence. To obviate, though but in part, this inconvenience dependent on the publication of separate annual reports, I shall, in some of the subsequent tables, correct, by means of a comparison of numbers or proportions, the report of the last year with that of 1833.

Even, however, when the sources of error above noticed are guarded against, much will still remain to be done before this branch of statistics has assumed its proper rank in medical science, and before it has supplied all the information which may be fairly expected from it. Careful and long continued observations on the pressure, temperature, humidity, and currents of the atmosphere, on the radiation of heat from the earth's surface, the electric state of the air, and even its specific weight, ought to be brought into conjunction with the statements of the prevalence, the greater or less mortality, or the absence of particular diseases. It would be important, however, to ensure both continuity and accuracy in such meteorological enquiries; and should their value for this, as well as for other purposes of

science, appear to others as great as it does to myself, I trust that the numerous Provincial Literary and Philosophical Societies will undertake the labour of making the necessary observations, and of reducing them to one fixed scale. To obtain this latter and very desirable object, it will, of course, be necessary, that the instruments used should be compared with certain standard ones; and every facility for doing this, is offered by the British Association for the Advancement of Science. I would observe, that in mentioning the subjects of meteorological observations, I have not thought it requisite, when thus only incidentally noticing the matter, to enumerate all that should be attended to by the observers.

From the first general table it will be seen that there were 3342 cases in the year 1834, of which number 132 died. The following tables shew the number of cases, and of deaths, which occurred in each month, distinguishing those under the age of ten years from those above that age, and also whether males or females.

	MALES.				FEMALES.			
	Under 10 years.		Above that age.		Under 10 years.		Above that age.	
	CASES.	DIED.	CASES.	DIED.	CASES.	DIED.	CASES.	DIED.
January	43	3	95	5	45	3	152	5
February	35	1	92	7	41	0	145	3
March	45	1	70	2	38	2	115	5
April	29	2	80	5	43	4	140	3
May	43	5	73	1	40	2	117	0
June	35	2	83	6	40	2	111	0
July	27	1	77	3	29	1	123	1
August	37	2	62	3	39	3	144	3
September	47	5	74	6	37	5	110	3
October	38	3	61	6	32	1	139	2
November	32	1	81	1	44	1	108	5
December	33	2	71	2	29	0	118	3
Total	444	28	919	47	457	24	1522	33

	TOTAL MALES.		TOTAL FEMALES.		OF BOTH SEXES.	
	CASES.	DIED.	CASES.	DIED.	CASES.	DIED.
January	138	8	197	8	335	16
February	127	8	186	3	313	11
March	115	3	153	7	268	10
April	109	7	183	7	292	14
May	116	6	157	2	273	8
June	118	8	151	2	269	10
July.....	104	4	152	2	256	6
August	99	5	183	6	282	11
September ...	121	11	147	8	268	19
October	99	9	171	3	270	12
November ...	113	2	152	6	265	8
December ...	104	4	147	3	251	7
Total.....	1363	75	1979	57	3342	132

In the next table, the 3342 cases are arranged according to their occurrence before or after the age of ten years, and in the one or the other sex, but without reference to the period of the year; the proportionate mortality is likewise given in each instance. I have also added another column, headed thus, "For 1833 and 1834," in which is given the proportionate mortality of the cases which occurred in both these years.

	Under 10 years.	Died.	Proportionate mortality.	For 1833 and 1834.
Males	444	28	1 to 15,85	1 to 14,58
Females	457	24	1 to 19,04	1 to 13,84
	901	52	1 to 17,33	1 to 14,2
	Above that age.			
Males	919	47	1 to 19,55	1 to 26,36
Females	1522	33	1 to 46,12	1 to 41,45
	2441	80	1 to 30,5	1 to 34,32
	Males.			
Under 10 years.	444	28	1 to 15,85	1 to 14,58
Above that age.	919	47	1 to 19,55	1 to 26,36
	1363	75	1 to 18,17	1 to 20,84
	Females.			
Under 10 years.	457	24	1 to 19,04	1 to 13,84
Above that age.	1522	33	1 to 46,12	1 to 41,45
	1979	57	1 to 34,72	1 to 29,14
	Total.			
Males	1363	75	1 to 18,17	1 to 20,84
Females	1979	57	1 to 34,72	1 to 29,14
	3342	132	1 to 25,32	1 to 25,11

In the following shorter tables of some of the principal diseases, I have retained the same method of distributing the cases, according to the season of the year, and the age and sex of the patients, which I adopted in my former reports.

CHRONIC BRONCHITIS.

	MALES.		FEMALES.	
1st Quarter	33	7 died.	48	1 died.
2nd Quarter	18	0 died.	22	1 died.
3rd Quarter	12	0 died.	12	1 died.
4th Quarter	22	2 died.	35	2 died.
	85	9 died.	117	5 died.

		For 1833 and 1834.
The 202 cases of chronic bronchitis are, to the whole number of cases of disease, as	1 to 16,55	1 to 17,14
The deaths, 14, are, to the 202 cases, as...	1 to 14,43	1 to 15,54
..... to the whole number of deaths, as	1 to 9,43	1 to 10,61
.... to the whole number of cases of disease, as	1 to 238,71	1 to 266,36

In the following two lines I have given the proportion which the deaths from consumption alone bear to the whole number of deaths, and the whole number of cases, which occurred in the two years 1833 and 1834.

The proportionate mortality for the whole number of deaths is, as.....	1 to 4,64
of cases of disease is, as	1 to 116,53

SYNOCHUS AND TYPHUS.

	MALES.				FEMALES.			
	Under 10 years.		Above.		Under 10 years.		Above.	
1st Quarter ...	17	0 died.	14	1 died.	29	0 died.	22	0 died.
2nd Quarter ...	11	1 died.	9	1 died.	10	0 died.	4	0 died.
3rd Quarter ...	13	1 died.	11	2 died.	9	2 died.	21	1 died.
4th Quarter ...	25	3 died.	24	3 died.	40	2 died.	42	3 died.
	66	5 died.	58	7 died.	88	4 died.	89	4 died.

		For 1833 and 1834.
The 301 cases of fever are, to the whole number of cases of disease, as	1 to 11,1	... 1 to 14,51
The deaths, 20, are, to the 301 cases, as ...	1 to 15,05	... 1 to 15,84
..... to the whole number of deaths, as.....	1 to 6,6	... 1 to 9,28
..... to the whole number of cases of disease, as.....	1 to 167,1	... 1 to 229,94

RUBEOLA.

	MALES.		FEMALES.	
1st Quarter	1	0 died.	7	0 died.
2nd Quarter	23	4 died.	28	3 died.
3rd Quarter	10	1 died.	10	1 died.
4th Quarter	5	0 died.	0	0 died.
	39	5 died.	45	4 died.

All these cases occurred under the age of ten years.

The 84 cases of measles are, to the whole number of cases of disease, as	1 to 39,78
The deaths, 9, are, to the 84 cases, as	1 to 9,33
..... to the whole number of deaths, as ...	1 to 14,67
..... to the whole number of cases of disease, as	1 to 371,33

SCARLATINA.

	MALES.				FEMALES.			
	Under 10 years.		Above.		Under 10 years.		Above.	
1st Quarter ...	0	0 died.	1	0 died.	0	0 died.	2	0 died.
2nd Quarter ...	9	1 died.	1	0 died.	8	0 died.	1	0 died.
3rd Quarter ...	8	2 died.	3	0 died.	12	1 died.	3	0 died.
4th Quarter ...	6	0 died.	1	0 died.	2	0 died.	1	0 died.
	23	3 died.	6	0 died.	22	1 died.	7	0 died.

		For 1833 and 1834.
The 58 cases of scarlatina are, to the whole number of cases of disease, as	1 to 57,62	... 1 to 55,32
The deaths, 4, are, to the 58 cases, as ...	1 to 14,5	... 1 to 19,
..... to the whole number of deaths, as	1 to 33,	... 1 to 42,43
..... to the whole number of cases of disease, as.....	1 to 835,5	... 1 to 1051,

VARIOLA.

	MALES.						FEMALES.					
	Under 10 years.			Above.			Under 10 years.			Above.		
1st Quarter ...	10	1	died.	2	0	died.	2	1	died.	0	0	died.
2nd Quarter ...	0	0	died.	0	0	died.	1	0	died.	0	0	died.
3rd Quarter ...	1	0	died.	0	0	died.	0	0	died.	1	0	died.
	11	1	died.	2	0	died.	3	1	died.	1	0	died.

The 17 cases of small-pox are, to the whole number of cases of disease, as ..... } 1 to 196,59

Four cases of small-pox after vaccination occurred among my infirmary patients, in the year 1834; three in January, and the fourth in April. My notes of these cases are very brief; they are as follows:

January 14.—Mary Chalterton, 15 years of age; was vaccinated fourteen years since; the cicatrix is small but distinct. Eruption of small-pox very trifling, but preceded by much fever. When her illness began she had been for some time in attendance on a woman who was very ill with small-pox.

January 22.—Anne Allsop, 9 years of age; was vaccinated eight years and a half ago; one of the marks is still distinct. The disease was not very severe, but accompanied with much fever.

January 23.—James Harper, 9 years of age; was vaccinated eight years since; one mark distinct. The disease severe.

April 15.—Anne Butterworth, 8 years of age; was vaccinated when nine months old; there are two cicatrices very distinct and good. The small-pox was very slight. Another child in the same house had the small-pox the preceding week, and died; and other children in the yard had recently had the disease.

PERTUSSIS.

	MALES. Under 10 years.		MALES. Above.		FEMALES. Under 10 years.		FEMALES. Above.	
1st Quarter ...	13	1 died.	1	0 died.	13	2 died.	1	0 died.
2nd Quarter ...	7	1 died.	1	0 died.	9	2 died.	0	0 died.
4th Quarter ...	1	0 died.	0	0 died.	1	0 died.	0	0 died.
	21	2 died.	2	0 died.	23	4 died.	1	0 died.

	For 1833 and 1834.
The 47 cases of hooping cough are, to the whole number of cases of disease, as	1 to 71,1 ... 1 to 51,82
The deaths, 6, are, to the 47 cases, as ...	I to 7,83 ... 1 to 11,83
..... to the whole number of deaths, as	1 to 22, ... 1 to 24,75
..... to the whole number of cases of disease, as.....	1 to 557, ... 1 to 613,17

CONSTIPATION.

	MALES.		FEMALES.
1st Quarter	5	0 died.	23
2nd Quarter	5	0 died.	22
3rd Quarter	5	I died.	17
4th Quarter	3	1 died.	13
	18	2 died.	75

	For 1833 and 1834.
The 93 cases of constipation are, to the whole number of cases of disease, as ...	1 to 35,94 ... 1 to 41,57

It will be seen that two of these cases terminated fatally. In neither was there any hernia, or sign of internal strangulation. The two patients were men advanced in life, one being 77, and the other 84 years old; they had been bed-ridden for a long time; they suffered very little pain; and their bowels appeared quite insensible to the stimulus of drastic purgatives, and of the injection, per anum, of large quantities of warm water. Permission to examine the bodies was refused.

CHOLERA BILIOSA.

	MALES.	FEMALES.
3rd Quarter..... ...	10	21
4th Quarter.....	1	3
	11	24

	For 1833 and 1834.
The 35 cases of bilious cholera are, to the whole number of cases of disease, as...	1 to 95,49 ... 1 to 108,2

DIARRHŒA.

	MALES.						FEMALES.					
	Under 10 years.			Above.			Under 10 years.			Above.		
1st Quarter ...	10	0	died.	5	0	died.	5	0	died.	6	0	died.
2nd Quarter ...	5	0	died.	4	0	died.	5	0	died.	7	0	died.
3rd Quarter ...	38	1	died.	11	0	died.	36	3	died.	21	0	died.
4th Quarter ...	16	0	died.	1	0	died.	12	0	died.	15	0	died.
	69	1	died.	21	0	died.	58	3	died.	49	0	died.

	For 1833 and 1834.
The 197 cases of diarrhœa are, to the whole number of cases of disease, as...	1 to 16,96 ... 1 to 20,49

DYSPEPSIA.

	MALES.	FEMALES.
1st Quarter.....	6	43
2nd Quarter.....	11	42
3rd Quarter.....	16	51
4th Quarter.....	13	34
	46	170

	For 1833 and 1834.
The 216 cases of dyspepsia are, to the whole number of the cases of diseases, as	1 to 15,47 ... 1 to 17,35

Newhall-street, Birmingham,
February 15, 1835.

A REPORT OF THE OUT-CASES,

ATTENDED

BY FREDERICK RYLAND, ESQ.

AT THE BIRMINGHAM INFIRMARY,

BETWEEN THE 25TH DECEMBER, 1833, AND THE 25TH DECEMBER, 1834.

	Qr. ending March 25.		Qr. ending June 24.		Qr. ending Sep. 29.		Qr. ending Dec. 25.		TOTAL.	
	CASES	DIED.	CASES	DIED.	CASES	DIED.	CASES	DIED.	CASES	DIED.
Abortion	3	...	2	...	2	...	1	...	8	...
Abscess	23	...	18	...	18	...	9	...	68	...
Amenorrhœa	6	...	7	...	3	...	3	...	19	...
Anasarca	8	1	4	...	5	3	9	4	26	8
Apoplexy	...	...	1	...	...	...	1	1	2	1
Aphthæ	3	...	1	...	1	...	4	...	9	...
Ascites	2	1	...	...	1	...	...	...	3	1
Bronchitis	71	3	82	2	51	2	70	1	274	8
~~ chronic.	41	...	42	1	23	...	43	...	149	1
Burns	4	...	1	...	1	...	4	1	10	1
Bronchocele	1	...	...	...	...	...	...	...	1	...
Carcinoma	1	1	...	...	3	2	...	...	4	3
Cephalalgia	3	...	5	...	4	...	3	...	15	...
Chlorosis	1	1	...	...	...	...	1	...	2	1
Cholera biliosa	...	...	1	...	13	...	...	...	14	...
Chorea	1	...	1	...	1	...	...	...	3	...
Colica pictonum	...	...	...	...	1	...	1	...	2	...
Constipation	10	...	12	...	16	...	15	...	53	...
Convulsions (Inft.)	2	2	2	1	...	...	...	...	4	3
Cutaneous diseases.	37	...	26	...	26	...	11	...	100	...
Cynanche tonsil	5	...	6	...	10	...	13	...	34	...
~~ trachealis.	...	...	...	...	1	1	...	...	1	1
Cystitis	...	...	...	...	...	...	1	...	1	...
Dentition	2	...	1	1	2	...	3	...	8	1
Diarrhœa	30	1	22	1	95	4	31	2	178	8
Diseases of bones	...	...	...	...	4	...	3	...	7	...
~~ eyes	5	...	11	...	12	...	4	...	32	...
~~ joints	5	...	3	...	4	1	3	...	15	1
Disordered bowels.	5	...	2	...	7	...	6	...	20	...
Dysentery	3	...	1	...	10	...	4	...	18	...
Dyspepsia	44	...	39	...	53	...	26	...	162	...
Dysuria	2	...	1	...	2	...	2	...	7	...
Epilepsia	2	...	3	...	...	...	1	...	6	...
Erysipelas	2	...	8	...	1	...	8	...	19	...
Erythema nodosum	...	...	...	...	2	...	3	...	5	...
Fistula in ano	...	...	...	...	1	...	...	...	1	...
Fractures	1	...	2	...	2	1	2	...	7	1
Fungus hæmatodes.	...	...	...	...	1	1	...	...	1	1
Gastritis	1	...	2	...	...	...	...	...	3	...
~~ chronic	26	...	19	...	18	...	13	...	76	...
Gonorrhœa	13	...	17	...	13	...	5	...	48	...
Hæmatemesis	1	...	1	...	...	...	1	...	3	...
Hæmoptysis	3	...	5	...	...	...	...	...	8	...
Hæmorrhoids	3	...	4	...	2	...	2	...	11	...
Hemicrania	4	...	3	...	6	...	2	...	15	...
Hepatitis	1	...	1	...	3	2	...	...	5	2
Hernia	4	...	3	...	2	...	2	...	11	...
~~ humoralis	2	...	...	...	1	...	2	...	5	...

	Qr. ending March 25.		Qr. ending June 24.		Qr. ending Sept. 29.		Qr. ending Dec. 25.		TOTAL.	
	CASES	DIED.	CASES	DIED.	CASES	DIED.	CASES	DIED.	CASES	DIED.
Herpes Zoster	...	...	1	...	1	...	...	...	2	...
Hydrocepalus, ac.	1	1	1	...	1	1	...	...	3	2
,, chr.	1	1	...	...	...	...	...	...	1	1
Hypertro. of heart.	3	...	2	...	...	...	...	...	5	...
Hysteria	2	...	5	...	...	...	4	...	11	...
Icterus	2	...	3	...	3	...	1	...	9	...
Laryngitis	...	...	...	...	1	...	1	1	2	1
Leucorrhœa	1	...	1	...	1	...	4	...	7	...
Mania	1	1	5	...	3	1	1	...	10	2
Marasmus	1	1	1	...	...	...	...	...	2	1
Menorrhagia	8	..	8	...	6	...	7	...	29	...
Nephritis	...	...	...	...	1	...	...	...	1	...
Otitis	...	...	...	...	3	...	...	...	3	...
Paralysis	1	...	4	1	3	...	3	...	11	1
Pericarditis	...	...	...	...	2	1	...	...	2	1
Peritonitis	4	...	...	...	1	...	4	2	9	2
,, puerperal	1	...	2	...	2	...	...	...	5	...
Pertussis	12	1	11	...	3	...	2	...	28	1
Phlegmasia dolens	...	...	1	...	...	...	...	...	1	...
Phlogosis	18	...	14	...	13	...	8	...	53	...
Phrenitis	1	...	...	...	...	...	1	1	2	1
Phthisis pulmon.	20	10	11	7	5	4	10	7	46	28
Pleuritis	15	...	3	...	8	1	4	...	30	1
Pleurodynia	8	...	10	...	7	...	7	...	32	...
Pneumonia	1	1	1	...	3	...	1	...	6	1
Podagra	2	...	1	...	...	...	1	...	4	...
Prolapsus ani	...	...	1	...	3	...	2	...	6	...
,, uteri	...	...	3	...	1	...	2	...	6	...
Purpura	1	1	...	...	...	...	...	...	1	1
Purul. discharge from the pudenda, in children	2	...	...	...	...	...	...	...	2	...
Parotiditis	1	...	6	...	...	...	...	...	7	...
Ramollis. of brain.	...	...	1	1	...	...	1	1	2	2
Rheumatism acute.	37	...	45	...	29	...	26	...	137	...
,, chron.	9	...	13	...	12	...	12	...	46	...
Rubeola	3	2	21	4	9	1	8	...	41	7
Scarlatina	21	1	5	1	18	...	8	...	52	2
Scrofula	7	...	6	1	6	...	5	...	24	1
Stricture of urethra	1	...	...	...	...	...	1	...	2	...
Synochus	65	1	46	2	128	4	73	6	312	13
Syphilis	8	...	5	...	6	...	4	...	23	...
Tumors	1	...	...	...	...	...	1	...	2	...
Typhus	...	...	1	1	...	...	1	...	2	1
Ulcers	9	...	14	...	13	...	7	...	43	...
Urticaria	5	...	2	...	1	...	2	...	10	...
Varicella	...	...	5	...	...	...	...	...	5	...
Varices	...	...	1	...	...	...	1	...	2	...
Variola	11	3	22	6	3	...	...	...	36	9
,, after vacci.	2	...	2	...	2	1	...	...	6	1
Worms, intestinal.	11	...	10	...	9	...	1	...	31	...
Wounds, strains, contusions, &c.	35	3	42	...	36	...	23	1	136	4
Total	713	37	695	30	764	31	549	28	2721	126

Having heard, only four days ago, that the publication of another volume of the Transactions of the Provincial Medical and Surgical Association was about to take place immediately, I am prevented, by the shortness of the time, from making any lengthened remarks upon the preceding report. I shall, however, offer a few upon the mortality in some of the principal diseases, and upon the sex and age of the deceased.

The total number of cases is 2721; of these 1127 were males, and 1594 females; of the latter, 696 were married, and 177 widows.

The total number of deaths is 126; of these, 65 were males, and 61 females. The following table shows the relative mortality of the two sexes at different ages:

	Under 1 Year.	Between 1 & 2.	Between 2 & 10.	Between 10 & 20.	Between 20 & 30.	Between 30 & 40.	Between 40 & 50.	Between 50 & 60.	Between 60 & 70.	Between 70 & 80.	Above 80.
Males	4	6	18	2	4	8	3	9	3	6	1
Females	7	4	17	3	7	5	7	3	6	3	0
Both sexes	11	10	35	5	11	13	10	12	9	9	1

According to the above table, the number of deaths in both sexes, during the first ten years, is equal; and the aggregate forms 4-9ths of the total number of deaths.

Bronchitis.—The deaths by this disease were 8, 4 of which were males, and 4 females, and all under three years of age.

Diarrhœa.—Eight patients died of this complaint, 4 males, and 4 females; 5 of them were under two years of age, and their death must be attributed

more to the neglect of their parents, than to the virulence of the disease, as in 4 of the cases the patients were in a moribund state when I was called to them, and they died immediately after the first visit. The remaining 3 were between 60 and 80 years of age.

The number of deaths by fever was 13, of which 5 were males, and 8 females. The following table shews their relative ages:

	Under 10.	Between 10 & 20.	Between 30 & 40.	Between 60 & 70.	Total.
Males	2	2	1	0	5
Females	5	2	0	1	8
Both sexes	7	4	1	1	13

Fever was very prevalent in Birmingham during the summer quarter; it chiefly affected the bowels, producing ulceration; at least, in every case in which I had the opportunity of examining the body after death, ulcers were found in the cœcum and ileon.

One of the cases, in which ulceration of the bowels was found, is curious, from the circumstance of the patient dying of hæmorrhage that had its source in the ulcers. John Taylor, æt. 34, shoemaker, was seized with fever on the 4th of November. Under the usual treatment he seemed to be improving rapidly, and began to take nourishment, when in the night of the 16th he had two large motions, composed almost entirely of blood. There was no particular fulness about the bowels, but pain was felt on pressure being made in the right iliac region.

17th.—The hæmorrhage from the bowels conti-

nued; and early in the morning of the 11th, he was found dead, a great quantity of blood having flowed into the bed, unobserved by the attendants.

Sectio cadaveris, twenty-nine hours after death.—The body was remarkably exsanguineous throughout. A great quantity of dark fluid blood was found in the colon, the cœcum, and the lower part of the ileon; the rest of the small intestines were pale and healthy. Numerous ulcers were found in the cœcum, and four large ones in the last six inches of the ileon; the latter were deep and sloughy, and it is probable, that from them the hæmorrhage had taken place, which terminated the patient's existence. A minute examination shewed no other source for the blood.

The following table exhibits the relative mortality of the consumptive patients, with respect both to age and sex:

	Between 20 & 30.	Between 30 & 40.	Between 40 & 50.	Between 50 & 60.	Total.
Males	2	7	3	6	18
Females	5	2	3	0	10
Both sexes	7	9	6	6	28

All the deaths from rubeola and variola occurred in children under 10 years of age. The number of males who died of measles was 5; of females 2. Of small-pox the number of males was 4; of females 5.

In the report, one case of death by small-pox after vaccination is recorded. Emanuel Baker, five months old, was vaccinated at the dispensary on the 4th of August; the vesicle was large and perfect, when it was seen by the surgeon on the 11th. In

the evening of that day he became unwell, and small-pox appeared on the 4th. It was of the distinct species, but the pustules were numerous, and their vigour not at all mitigated by the previous vaccination. The boy died convulsed on the 20th.

Perhaps I may here mention a case of absence of the uterus, as it is of rare occurrence. Hannah Mack, æt. 19, servant, was admitted into the infirmary, on the 29th of August, 1834, with peritonitis, of which she died in thirty-six hours. On examining the body, the peritonitis was found to have arisen from the escape of fœcal matter through an ulcer of the ileon. As the girl had never menstruated, I wished to examine the uterine organs, but no uterus could be found. Within the fold of the broad ligament, where the uterus should have been, there was a firm, round, fibrous cord, four inches long and thicker at the extremities than in the middle. To each extremity of this cord the fallopian tube of the corresponding side was attached, becoming impervious just previous to its junction with it. The ovaries were of the natural size, the fallopian tubes well developed. There was no trace of a vagina; the external parts below the meatus urinarius were closed by a strong membrane. The body was small, but well formed; the feminine character of the skeleton was marked; there was an unusual quantity of hair on the pubes and in the axillæ; and the mammæ were small, but decidedly formed.

FRED. RYLAND.

Birmingham,
17th February, 1835.

APPENDIX

TO

MR. RYLAND'S REPORT.

One great object of medical statistics undoubtedly is, to exhibit the liability of persons of various ages, and of different sexes, to suffer from certain diseases. To contribute towards the furtherance of this object, I have constructed the following table, which shews the relative number of those of both sexes, who have come under my care during the past year, affected with some of the most prevalent disorders, distinguishing their ages at the same time. With regard to the great disparity that exists between the number of the male and the female patients above the age of 10, something may be attributable to the existence, in Birmingham, of sick-clubs for the men, to a much greater extent than for the women. But, even taking this into consideration, the proportion of females would still be large, and especially in the more chronic diseases.

	Under 10 years.		Between 10 and 20.		Between 20 and 30.		Between 30 and 40.		Between 40 and 50.		Between 50 and 60.		Above 60.		TOTAL.	
	Males.	Fem.	Males.	Fem.	Males.	Fem.	Males.	Fem.	Males.	Fem.	Males.	Fem.	Males.	Fem.	Males.	Fem.
Bronchitis	54	72	13	12	8	26	16	19	13	19	8	7	4	3	116	158
Chronic bronchitis	...	...	3	...	3	5	5	14	11	20	14	25	15	34	51	98
Constipation	1	3	4	9	7	6	4	3	1	6	2	2	4	1	23	30
Dyspepsia	...	...	4	9	11	21	8	28	6	28	3	22	7	15	39	123
Chronic gastritis	...	...	3	23	2	14	1	9	6	11	1	6	...	...	13	63
Paralysis	...	...	...	...	1	1	...	...	2	...	2	1	...	4	5	6
Rheumatism	3	3	9	12	13	12	19	12	12	16	9	11	2	4	67	70
Chro. rheumatism	...	...	1	...	1	4	2	4	6	9	3	6	4	6	17	29
Synochus	71	49	39	53	12	16	10	21	8	17	1	7	1	7	142	170
	129	127	76	118	58	105	65	110	65	126	43	87	37	74	473	747

An analysis of the above table shews us, that the persons affected with acute bronchitis and continued fever, under the age of 20 years, greatly exceeded in number those who suffered from the same diseases in all the subsequent periods of life: in fever this is remarkably the case. The numerical disproportion that exists between the male and female children, in bronchitis and synochus, is probably accidental. The liability to these complaints seems to diminish in tolerably just proportion with the advance of years; whilst the contrary is observed with regard to chronic bronchitis and chronic rheumatism: these are essentially the diseases of old age; and the females afflicted with them largely exceed the males in number, nearly in the ratio of 2 to 1.

Dyspepsia.—This disease would appear to afflict females much more extensively than the other sex; and, taking into consideration the rapid diminution that occurs of persons advancing in years, dyspepsia, like the last mentioned diseases, seems to be more particularly the scourge of the decline of life.

In chronic gastritis, or inflammatory dyspepsia, the proportion of females to that of males is nearly at 5 to 1. The largest number of cases occurred between the ages of 10 and 20. Of the 3 males, 2 were brass-casters; of the 23 females, all were unmarried, 5 were sempstresses, 5 domestic servants, 3 pearl-button makers; and, in almost every instance, the complaint was accompanied by disorder of the menstrual functions, and in most of the cases by amenorrhœa. Of the cases of this disease that occurred between the ages of 20 and 40, several

appeared to be referrable to the long continued suckling of their children, in which many of the women had indulged.

Neither in acute rheumatism, nor in constipation, do we observe any remarkable disparity between the different ages or sexes; the active periods of life appear to be most obnoxious to the former disease.

Paralysis.—Two of the cases were instances of paralysis of the extensor muscles of the hand and fingers, causing that peculiar dropping of the hand, which is frequently seen in those persons who work much with lead. Both the sufferers were brass-cock-founders; and so prevalent is the affection amongst this class of workmen, that it is familiarly denominated the cock-founder's disease.

I have been at some little pains to seek out the reason of the occurrence of this complaint amongst artizans of the above description, and there can be no doubt that it is owing to the lead, which forms nearly a fourth part of the compound metal of which the cocks are made. The "*drop*" of the hands never affects the *casters*, although they are exposed to the fumes of the heated metal; it occurs only in those workmen who are engaged in the filing and polishing of the brass cocks. During these processes the article is covered with oil or grease of some description, and in order that the workman may see whether sufficient effect has been produced by his file or his lathe, he rubs off the greasy matter, which is full of small particles of the metal, with the palm of the hand or the wrist, and this is done many times in a minute. It is probable that the presence of the grease materially assists the friction and pressure in forcing the lead through the pores of the skin.

The extensors of the hand and fingers, the supinators of the hand, and the flexors of the thumb, are the only muscles that lose their power. One of the patients referred to in the present report, had a regular attack of lead-colic; but it is worthy of remark, that the brass-cock-founders very seldom experience any ill effects from the lead, except the dropping of the hands. I have inquired of many men afflicted with the complaint in question, if they had been subject to dyspeptic disorders, to constipation, or to colic, and I have always received an answer in the negative. In painters the colic is far more common than this paralytic affection of the hands; and those who have laboured under the latter, have generally suffered severely from the former disease at previous periods.

One of the cases of paralysis was of that kind called the shaking palsy, or *tremblement mercuriel;* it occurred in an old woman who had formerly been a gilder. This disease is now become very rare in Birmingham, the present improved mode of gilding having done away with the imminent risk of health and life, which formerly attended this branch of manufacture.

F. R.

PART V.

Biography.

BIOGRAPHICAL SKETCH

OF THE

LATE DR. ROBERT JACKSON,

INSPECTOR OF MILITARY HOSPITALS.

BY THOMAS BARNES, M.D. F.R.S.E.

Physician to the Carlisle Dispensary and Fever Hospital.

The memoirs of eminent physicians are often both useful and instructive to the members of the profession. They not unfrequently furnish examples worthy of their imitation and emulation. The subject of the following memoir affords an instance of the power that strong natural talents, and great industry, possess, in raising men of humble birth and obscure station to honour and distinction. Although he was chiefly distinguished as an army physician, and as a scientific traveller, yet, as he devoted a part of his life to the duties of a provincial medical practitioner, this brief sketch may, perhaps, not improperly have a place in the Transactions of the Provincial Medical and Surgical Association.

The lives of scientific travellers are generally interesting. The objects of their pursuits are various: some spend their time in investigating plants and animals, and some in the examination of minerals. Every department of nature has its admirers: zoology, botany, mineralogy, and geology, have each engaged their attention, and have induced them to brave many dangers in distant countries. The investigation of malignant and fatal diseases, in a foreign country, would, to many persons, be an uninviting pursuit. This belongs to the province of medicine; and the scientific physician finds it as interesting and engaging as any other. To the subject of this memoir, these diseases were great objects of attraction. The examination and treatment of malignant fevers, in various climates, and at various seasons, constituted the chief occupation of his life, and afforded him the greatest pleasure. In his youth, he studied them with the same minuteness and accuracy as in manhood; and in old age, with all the zeal and ardour of his youth.

Robert Jackson, M. D. inspector of army hospitals, and, for many years, chief of the medical department of the West Indies, was the son of a farmer in Lanarkshire, North Britain. Early in life he distinguished himself by his literary attainments, and by the zeal and assiduity with which he pursued his medical studies. He was born at Stone-Byers, near Lanark, in the year 1750. His parents were in poor circumstances; but what he wanted in patrimony, he made up by economy and industry. Having spent one winter in Edinburgh, he went on a voyage to Greenland, and saved as much money

by the expedition, as enabled him to pass another winter at the University.

After this brief academical education at Edinburgh, and with only a scanty stock of professional knowledge, he commenced his medical career in the army. In the beginning of the year 1774, he embarked as a passenger for Jamaica, with Captain Cunningham, a seafaring man, who had been master of a transport at the siege of Havannah. From this person he received the first suggestion of the use of cold bathing in fever. One day, during the passage, the Captain told him, that in 1756, some sick persons who were on board of his ship, which appeared to have been a kind of hospital ship, threw themselves into the sea, as if to drown themselves. The greater part of them, he observed, were recovered from the waves, and, as far as he recollected, they were restored to their senses, and benefited in their health by the immersion. This fact struck young Jackson strongly, as applicable to the cure of fever, and he availed himself of the first favourable opportunity of making trial of a similar experiment in the person of a sailor, in the latter end of May of the same year. A detachment of the 1st battalion of the 60th regiment, at that time quartered at Savanna-la-mar, in Jamaica, was committed to his medical superintendance. Between 1774 and 1778 he resided in the West Indies, and here he laid the foundation of his future fame and acquirements, by patient investigation of disease, and by taking notes of the cases that came under his consideration. These records, or clinical descriptions, were remarkable for their accuracy and minuteness. It was the

opinion of Jackson, at that time, that the remittent fevers of the West Indies proceeded in a definite course, and generally terminated on critical days. In this opinion, he says, he was afterwards confirmed, by observations made during a second residence in the same country.*

Being of an ardent and enterprising disposition, young Jackson thought the island of Jamaica afforded too limited a field for his observations: he wished to prosecute the study of fever in a new country, and, with this view, he volunteered service in the early part of the American war. His offer was accepted, and in 1778 he was appointed surgeon's mate to the late 71st regiment in North America, and obtained an ensigncy before the end of the war, it being not unusual at that time for one person to fill both situations. In this country, particularly on the southern States, he had extensive opportunities of observing different forms and degrees of fever, and he followed the rule he had adopted in Jamaica, of writing down histories and arranging facts at certain intervals.

He was always a most zealous medical officer, and often displayed great intrepidity and courage. In a skirmish which took place between the belligerent parties, and when the British were defeated and retreating, an English officer, we believe Colonel Tarleton, had his horse shot under him, and was found by Jackson, who immediately dismounted, and requested the officer to take his horse and ride off, as his life was of great consequence, and was then in jeopardy; for himself, he said, being an obscure individual, he felt no alarm. With

* Sketches of the History and Cure of Febrile Diseases.

great difficulty, he prevailed on the officer to mount, and make his escape. The Americans speedily came up, and Jackson, with much firmness and presence of mind, held up a white pocket handkerchief, as a flag of truce. They took him prisoner. He told them he was by profession a physician, and would wish to attend the sick and wounded soldiers. To this request they readily assented, and were soon much pleased with his skill, activity, and attention. Not long afterwards, he was allowed to return to the English, and a letter of thanks was given to him, in which his talents and philanthropy were mentioned in very flattering terms. At another time, during the American war, Jackson displayed equal bravery and contempt of danger. After one of the battles, when the British troops were under the command of Lord Cornwallis, and were retreating, a building into which the sick and wounded had been carried, was riddled by the shot of the enemy, and visiting it became so dangerous that the surgeons proposed casting lots to determine which of them should go and attend the wounded soldiers. Jackson, whose feelings were ever alive to the sufferings of his fellow creatures, was present, and when the proposal was made to him, he said, "No, no! I will go and attend them:" and he did so.

In 1793, we find that he was an ensign on half-pay, and settled, as physician, at Stockton-upon-Tees, where he enjoyed a high reputation, and an extensive practice. But previous to this time, and after his return from America, in 1782, he devoted several years to the improvement of his academical knowledge. He travelled over a great part of

Europe, in search of information, and visited many medical and military establishments. He studied for some time at Paris, and afterwards went to Leyden, where he took the degree of Doctor in Medicine.

Private practice, in a provincial town, neither suited his views nor disposition. He wished to enlarge the sphere of his observations, and in the month of September, 1793, he offered to serve as army physician to the troops which were collecting for an expedition destined for the West Indies. The investigation of tropical fever still occupied much of his attention, and he thought he should have a better opportunity of extending his views, and prosecuting his studies of it, in the army, than in civil life. Not having borne a medical commission, Dr. Jackson was not eligible to the rank of physician to the forces, according to a regulation of that day, made by the late Mr. Hunter, who was then surgeon-general, and his wishes were not complied with. Being disappointed in this expectation, he accepted the rank of surgeon to the 3rd regiment of foot, or the Buffs, destined for the West Indies, under the command of Lieutenant-General Sir Charles Grey, under the condition that he should be elected physician, on the first proper occasion. The destination of the corps was changed: it was sent out, under Earl Moira, to invade France; and after reconnoitering the coast at a distance, for some days, returned to England. The Buffs were very sickly, and suffered much from contagious fever. Jackson afterwards accompanied the regiment to Flanders, where he had ample opportunity of tracing all the varieties of infectious fever usually deno-

minated typhus. In the autumn of 1794, the Buffs arrived at Bergen-op-zoom, in high health; but very soon afterwards most of them, excepting only the commissioned officers, were attacked with the usual fever.

His late Royal Highness the Duke of York, Commander-in-chief, being aware of Dr. Jackson's great merits and services, appointed him, in 1795, acting physician to the forces; and a short time after, on the death of Dr. Kennedy, who had served as inspector of hospitals, he was raised to the rank of chief inspector, and succeeded him. This was also the act of his Royal Highness the Duke of York. The Doctor not having the usual qualifications, the medical board opposed the appointment, and remonstrated against it. But notwithstanding the opposition, he retained the situation until the British troops were withdrawn from the Continent; and he discharged the arduous duties devolving upon him, with much ability and zeal.

Immediately after his return, he went to the island of St. Domingo, and there availed himself of the opportunity of examining the nature and causes of endemic, and epidemic disease. The duty assigned to him, it is said, afforded him the means of investigating these diseases more fully than any other person on the medical staff of that island.

Self-advancement was never his object. It will ever redound to his praise for moderation and disinterestedness, that having obtained the rank of army physician, he never afterwards solicited higher rank or emolument; and he always offered his services to the public when he thought they would be

useful. He was desirous of extending his knowledge of fever in the West Indies, and, in 1796, accompanied the expedition which was sent out to Saint Domingo, under the command of General Sir Ralph Abercrombie. The division of troops assembled at the Cove of Cork, in the month of October, 1795, and being detained the greater part of the winter, in very confined quarters, the mortality was considerable. Those that were under the care of Dr. Jackson, at a temporary hospital in Spike Island, were treated by him with great success. In St. Domingo he was inspector and head of the medical department, and was unremitting in his investigations of disease; he collected facts with much patience and research, and he continued his usual practice of writing the history of cases at the bedside of his patients.

From St. Domingo, Dr. Jackson made an excursion of pleasure, through the United States of America, with his friend Dr. Borland, who has paid a just and honourable tribute to his memory, in a memoir read at the anniversary meeting of the officers of the medical department, 12th of May, 1827.* The yellow fever was then prevailing at Philadelphia and New York, and Dr. Jackson seized the opportunity of making himself well acquainted with the disease. In the city of Philadelphia alone, it is said, that not less than 3446 persons fell victims to the epidemic. Here he had the happiness of meeting the celebrated Dr. Rush, and some other American physicians, who paid him marked respect and attention, his professional character and reputation having previously reached them.

* Edinburgh Medical and Surgical Journal, No. 94.

In the year 1798, he returned home; and after the British troops were withdrawn from Holland, in the latter end of the following year, the medical superintendance of the Russian auxiliary force, which acted with the British in the expedition to the Helder, and consisted of 17,000 men, was entrusted to him, by desire of the Russian Ambassador, Count Woronzow. The troops were ordered to the islands of Jersey and Guernsey, for winter cantonments, and being crowded in the transports during boisterous weather, became very sickly. A severe infectious fever prevailed among them; and such was the eminent success of Dr. Jackson's practice and good management, that his Royal Highness, the Commander-in-chief, was induced to appoint him, the following year, (1800) on the death of Dr. Mitchell, to the situation of army physician, and head of the army depôt hospital at Chatham. When this depôt was removed to the Isle of Wight, the accommodations were inadequate to the necessities of the sick, and the number of sick increased during the whole winter. The disease, Dr. Jackson remarked, was aggravated by several circumstances; and being ever anxious to benefit both the soldier and the public, he introduced many alterations and improvements into the diet tables of the sick and convalescent. Great order, economy, and arrangement, were also observed in the wards of the hospital; and the expenditure was considerably diminished. At the time of his appointment, the full diet of a sick soldier, was a pound of beef more daily, than for a soldier on duty in barracks. Than this nothing could be more absurd. The rate of diet was re-

duced; the sick had a sufficient allowance, and a great saving was effected. It so happened, that greater numbers than usual, of serious cases, were admitted into the hospital at this period, and, consequently, there was a greater mortality than before. A number of recruits and invalids had been always in the hospital before this time; and when they were affected with the itch, or any other trifling complaint, were put on the hospital books. As the Doctor had received several appointments without the sanction of the army medical board, his alterations of the diet table excited considerable jealousy. He was accused, by the board, of putting the patients upon too scanty an allowance; and this was very unjustly alleged as the principal cause of the increased mortality. The cold affusion which he employed in the cure of fever, was also represented as a dangerous and destructive practice. A regular investigation took place; Dr. Jackson was exculpated, and the Commander-in-chief testified his approbation of the Doctor's services and conduct. The physician and surgeon-general, however, still retained their official situations; and the Doctor finding that he could not serve satisfactorily under them, resigned, and again returned to Stockton-upon-Tees. The Commander-in-chief, in accepting Dr. Jackson's resignation, expressed deep regret at the loss of the sevices of so valuable a medical officer, and said he retired without a stain upon his character. Being in London a short time afterwards, the Doctor met Mr. Keate, the surgeon-general, in the street: some angry words passed between them, and though Jackson was naturally of a meek

and placid disposition, yet feeling that he had been calumniated, and unjustly treated by him, he held up his umbrella, and told the surgeon-general he might consider himself as horsewhipped for his behaviour; but if he did not think that enough, he (the Doctor) would do it for him properly. For this, Mr. Keate brought an action of assault; and Dr. Jackson was convicted, and sent to the King's Bench until he should make an apology, which the writer has been informed he never made. An intimate friend who called to see him when in prison, found him alone, with his table covered with books and papers, busily occupied writing, and apparently quite happy. After his liberation he lived some years in retirement, and devoted himself chiefly to literary pnrsuits.

A new arrangement of the medical department of the British army, similar to what he had often proposed and strongly advocated, took place in 1810. The board, which consisted of a physician-general, a surgeon-general, and an inspector-general, was dissolved, and a director-general appointed. The same objections to his taking office, therefore, no longer existed. In the year 1811, great sickness prevailed among the soldiers of the British army in the Windward and Leeward Islands, and Dr. Jackson voluntarily came forward and offered his services: they were accepted, and the charge of the medical department was confided to him. He repaired to the spot where the fever prevailed, and visited the patients five or six times every day, with a view to ascertain every thing relative to the history of the disease, and the manner of treating it. He

attributed it to an epidemic influence, or general condition of the air. In not one instance could he trace it to contagion. He remained several years in the West Indies, and carefully investigated the topography and diseases of the islands of Barbadoes, Antigua, St. Christopher, St. Eustatius, St. Martin, St. Thomas, Santa Cruz, Guadaloupe, Dominica, Martinico, St. Lucie, St. Vincent, Grenada, Tobago, and Trinidad; and the colonies of Demerara, Berbice, and Surinam. He also visited and inspected the island of Jamaica, under a special commission. Of every island and station he made a valuable official report to the director-general. In 1815 he returned to England, and afterwards published a summary of these reports, and the substance of his observations during his service in the West Indies.

Among the various remedies employed by Dr. Jackson, was cobweb. He appears to have entertained a very high opinion of its medicinal qualities.* He says it was more effectual than bark, or any other remedy, in preventing the recurrence of intermittent fevers, and that it possessed virtues in allaying pains and spasms, and other forms of irritation, superior to opium, or any anodyne with which he was acquainted. It very rarely failed to relieve the more alarming symptoms of the remittent or continued fever, unless such as depended on deep congestion, or actual inflammation in the membranes or substance of internal organs. The writer of this memoir takes the opportunity of mentioning, that not long ago he administered the cobweb, so much praised by Dr. Jackson, in a case of intermittent

* Sketch, &c. of Febrile Diseases, p. 259. 1817.

fever, without the least apparent benefit. The disease resisted both cobweb and quinine, and yielded readily to arsenic. Though it would be wrong to draw any inference from a single case, and that case an obstinate intermittent, it is not improbable that Jackson much over-rated the virtues and efficacy of the remedy.

In the summer of 1819, a fever of an alarming kind made its appearance at Cadiz. It was reported to be the yellow fever, which had ravaged the sea coasts of the south parts of Spain, at intervals, since the beginning of the present century. Dr. Jackson had seen much of the disease called yellow fever, in the West Indies, but the disease bearing that name in Spain, had not yet come under his notice, and he was anxious to learn, by his own experience, their difference or identity. He also conceived, that it might be an object of some importance to the nation, to ascertain, distinctly, whether or not it was contagious; and with the true spirit of philanthropy and love of science, this veteran physician proposed to the British government to go to Cadiz, and investigate the nature and causes of the fever. He made the offer through the director-general of the medical department, without any other condition than a passage free of expense, and such a mode of introduction to the Spanish authorities, as would enable him to prosecute his object without interruption. The offer was acceded to; and he embarked at Falmouth in December, and arrived at Gibralter about the end of the month. A few days after, when in the act of setting out from Gibralter to Cadiz, the governor of the garrison received infor-

mation that an insurrection had taken place among the military; that the *Isla de Leon* was in their possession, and the route to Cadiz, by land, consequently, obstructed.

This occurrence defeated his purpose. He remained nearly two months at Gibralter, and then undertook a journey to the Levant, at his own expense, partly with the design of seeing Greece, and partly in the hope of obtaining information respecting the diseases of the Mediterranean shores, particularly the plague. It was also his intention to visit the whole of the Ionian Islands that were under the protection of the British; and, after that, to have continued his course, by the sea coasts of Italy, France, and Spain, to Gibralter. His important object in pursuing this extended route, was to observe the medical topography of the different parts on the sea coast, and to enlarge and correct his views respecting the material cause of febrile diseases as a subject of general science. In prosecution of the above purposes, he went from Gibralter to Malta, Constantinople, Smyrna, Athens, and the Morea; and embarked at Patras for Zante. He was disappointed of witnessing the plague, as it did not prevail in the Levant during the time of his excursion. He was also disappointed in some of the other objects of his journey. He arrived at Zante in the month of June, and as it was his determination to be at Cadiz in August, to investigate the nature of the yellow fever, he had too little time to complete his journey. His advanced age, his infirm state of health, and his narrow pecuniary means, induced him to abandon the idea of travelling by

land, and he embraced the first opportunity that presented itself of proceeding by water. He embarked at Zante, and arrived in the latter end of July at Gibralter, and from thence he set out for Cadiz, where he arrived on the 25th of August. It was a remarkable circumstance, that the yellow fever had reappeared, and was announced on the very day Dr. Jackson entered the city, where it continued epidemic for two months or more. A similar disease, but more severe and fatal, raged at Xeres-de-la-Frontera about the same time; and after he had satisfied himself respecting the malady that prevailed at Cadiz, he went to the former place, with the view of ascertaining the nature of the disease there. Mr. O'Halloran, an active, able, and zealous surgeon, accompanied him to Cadiz and Xeres, to whom he acknowledges having been under great obligations.

At the time Dr. Jackson entered the army, much unnecessary expenditure was incurred in the management of the military hospitals, and he was the means of afterwards introducing various reforms in their economy and arrangement, by which large sums were saved to government. For these things, he was considered, by certain persons, meddling and officious; and although his reforms were great improvements, they made him many enemies. In the year 1796, he proposed a plan of economical management for the hospitals of the colonial and foreign troops, which were added to the British army for service in the island of St. Domingo. The plan was simple, viz. a ration suitable for sick persons, commuted *ad valorem*—fresh meat, in place of

salt; soft bread, instead of biscuits; wine, in place of rum; with the power of augmenting one part of the ration, viz. rice and sugar, and diminishing another, viz. beef and bread, at the discretion of the medical officer. The plan, which is obviously rational and plain, was carried into effect, but not without opposition, for it annulled a contract which, contrary to usage in the British service, had been made with colonial colonels, for the subsistence of the sick of their respective corps, at rates which certainly were most extravagant. By the plan substituted for this contract, the sick of the colonial troops, it is said, were amply provided for, and the enormous sum of £80,000 per annum was saved to the British government. The late much lamented Commander-in-chief was convinced of the justice and expediency of the Doctor's measures and views, and by his powerful interest the reforms proposed were effected. Such were Dr. Jackson's claims upon the government, that, in addition to his half-pay as inspector of hospitals, he was, for many years, allowed £200 per annum, in consideration of his services in the West Indies.

Dr. Jackson was the author of several valuable works, upon each of which we shall take leave to make a few brief remarks. It is not intended to review or analyse them, but merely to glance at some of their leading features. In 1791, Dr. Jackson published "A Treatise on the Fevers of Jamaica, with Observations on the Intermitting Fevers of America; and an Appendix, containing hints on the means of preserving the Health of Soldiers in Hot Climates." This interesting work was his

earliest performance, and contains several valuable and original observations, made by the author during his first residence in the West Indies and America. He was army surgeon first in Jamaica, and afterwards in the Southern States of America, where he had extensive opportunities of observing the different forms and degrees of fever.

In the year 1798, he gave to the world his "Outlines of the History and Cure of Fever, endemic and contagious, more particularly the Contagious Fevers of Jails, Ships, and Hospitals; with an Explanation of the Principles of Military Discipline and Economy, and a Scheme of Medical Management of Armies." Many parts of this work discover great and laborious research. Marsh miasma and contagion, Dr. Jackson considered the only causes of fevers, whether endemic or contagious. The source of endemic fever, he says, is a natural one, common to the whole earth; the source of contagious fever is artificial, produced by arrangements which take place among men, in certain states in society, and by an altered condition of the living human body. The former fever shews no disposition to propagate itself; the latter multiplies with great activity. This argument is urged by our author, with great perspicuity, and is placed in various lights. In this treatise, he contraverts the rules laid down by Dr. Currie, for the application of cold water to the surface, in cases of fever, and gives others of his own. This powerful remedy was frequently used by the antient physicians in fever, under various but undefined circumstances. Dr. Jackson was the first among the moderns who employed it to any consi-

derable extent; and he first introduced it into the hospitals of the British army. It must, however, be admitted, that the principles by which Dr. Currie was guided in the use of the remedy, were much more rational, clear, and explicit; and his practice was also more successful. But it ought to be remembered, that Dr. Jackson's patients resided in the West Indies, and he had, probably, to treat a more complicated, dangerous, and fatal disease than Dr. Currie. Much benefit is attributed, by our author, to gestation or travelling, in certain instances, in the fevers of St. Domingo and America.

In 1803, he published "Remarks on the Constitution of the Medical Department of the British Army, with a Detail of Hospital Management; and an Appendix, attempting to explain the Action of Causes in producing Fever, and the Operation of Remedies in effecting Cure." In 1804, appeared his "Systematic View of the Discipline, Formation, and Economy of Armies." From both of these works it would appear, that our author was by no means either an elegant or pleasing writer. Though they contain much useful and valuable information, the absence of grace, perhaps, of perspicuity, in the style, caused them to attract less notice than they deserved. The observations contained in the former volume, were of great practical importance; and though they did not at first meet with the approbation of those to whose consideration they were submitted, they were afterwards fully appreciated, and attended to by the inspector-general of hospitals. The diseases of armies, and particularly febrile diseases, had always engrossed much of his attention.

He had devoted nearly his whole medical life to the study and investigation of fevers, which he had witnessed of the most malignant kind, in a greater variety of climate, and under more various circumstances than almost any other physician. In this work he endeavours to communicate his knowledge and experience to the medical world. Some account is added of the causes that induced him to resign his situation at the depôt at the Isle of Wight. A letter had been addressed to the Secretary at War, stating that an unprecedented mortality had taken place among the soldiers, both at the Isle of Wight and at Chatham, and that it was occasioned by the mode of treatment followed by our author. He justifies himself from this accusation, by shewing that the deaths arose from the malignant nature of the diseases which prevailed; and in this he was borne out by the evidence of the four physicians, who were deputed, by the medical board, to examine and report upon the state of Parkhurst hospital, of which he had the superintendance. It is remarkable enough, that the mortality increased very much under the physicians who succeeded Dr. Jackson in the charge of this hospital. It does not appear, however, that this circumstance was attributed to any neglect or improper treatment on the part of these physicians.

About this time, Dr. Jackson addressed a letter to the Editor of the Edinburgh Review, in which he had been traduced and misrepresented. It was insinuated that he had evinced some want of candour and veracity in describing his practice of cold affusion. This insinuation he proved to be un-

founded. The affusion of cold water on the suface, was employed by De Haen, in the year 1737. It was tried by Dr. Wright, in his own person, in 1777; but the latter did not repeat the experiment, or publish the fact until the year 1786. Dr. Jackson made use of this remedy in 1774; and in 1791, he published his Treatise on the Fevers of Jamaica, which contained stronger commendation, and fuller proof, of the benefits of cold affusion, in certain circumstances of fever, than any modern book then extant.

In 1808, he produced an "Exposition of the practice of affusing Cold Water on the surface of the Body, as a remedy for the cure of Fever; to which are added Remarks on the effects of Cold Drink, and of Gestation in the open air, in certain Conditions of that Disease." This work seems to be an elucidation and extension of some of the preceding volumes on the same subjects. In it our author controverts the principal points of Dr. Currie's doctrine, and states, though not in very definite and intelligible terms, the principles by which he regulated his own practice.

Diffuseness of style, and looseness of expression, were the great faults of Dr. Jackson's early writings. He admits that the doctrine he labours to substitute in the place of Dr. Currie's, is obscure, and difficult to understand. He frankly acknowledges, that, after all the attention he has given the subject, he is still unable to produce an unerring rule by which the application of cold water can be safely regulated. This volume contains a description of various forms of fever; and shews that he possessed considerable

discrimination, and was a careful observer and collector of facts. The practice of cold affusion in febrile diseases, so strongly recommended, and so much praised, by Drs. Jackson and Currie, is now seldom had recourse to, and their controversy excites little interest. The remedy is, perhaps, better suited to the warmer regions, than to this conntry; and the indiscriminate use of it, probably, injured its reputation. Sponging the patient's body with vinegar and water, or tepid water, according to circumstances, is more generally adopted.

Dr. Currie's "Medical Reports" claim our admiration as specimens of classical composition, philosophical enquiry, and rational induction. His writings evince that he was an accomplished scholar, as well as a sagacious physician. In accuracy of observation, he was equal to Dr. Jackson; in clearness of argument, he was his superior.

In the volume now before us, Dr. Jackson gives a short history of the introduction of cold bathing as a remedy for fever. This history is necessarily imperfect; the author's mode of life prevented him from having access to those records which are rarely met with, except in extensive libraries.

In 1817, "A Sketch of the History and Cure of Febrile Diseases, more particularly as they appear in the West Indies, among the Soldiers of the British Army," was published by our author This excellent work, though called a sketch, is, more properly speaking, an epitome of all the practical observations made by him on febrile diseases. In the course of a long and varied medical life, he had collected materials, on this subject, sufficient to form

two quarto volumes; and as it was not in his power to print a work of that magnitude, he analysed these materials, and produced a summary or compendious abridgment of them in the present treatise.

In 1819, he published "A Sketch of the History and Cure of Contagious Fever." This volume contains the author's views of contagious fever, in the two-fold capacity of army physician and private practitioner. It abounds with profound researches and valuable remarks, and should be read by every one who wishes to obtain a correct knowledge of the phenomena of fever. The object of these two works, as the author informs us, was to give the result of his observations and experience,. in the history and treatment of febrile diseases. He has been severely censured and ridiculed for misuse of language, and for the obscurity of his doctrine and principles. In these volumes he endeavours to explain and elucidate his opinions and practice, adding corroborative documents in support of them. That peculiar phraseology which he had always employed, may, however, in some places, still be found; and perhaps, it would be too much to expect that he should, at a late period of life, entirely divest himself of it. The materials from which these treatises were formed, were collected during long experience in various scenes of service, and were both original and authentic. They evince extensive and laborious observation, originality of thought, and great discrimination and judgment. They also clearly prove him to have been a bold, an active, and a judicious practitioner. They may, undoubtedly, be considered his best medical works;

and upon them, must rest his future fame as an author, as well as a learned and skilful physician.

In 1821, Dr. Jackson published "Remarks on the Epidemic Yellow Fever, which has appeared, at intervals, on the south coast of Spain, since the year 1800." This is decidedly the best work on the subject; and, in the opinion of some persons, the author's best production. It contains a fund of most valuable information, clothed in appropriate language. Dr. Jackson gives an animated sketch of the medical topography of the country; a short history of the yellow fever of the south of Spain; and an elaborate and accurate description of the disease. He concludes that it is not contagious, and recommends blood-letting, and other means of depletion, as the best remedies He ascribes the origin of the malady to the physical qualities of the soil and atmosphere, and to the habits and modes of life of the Spaniards. Dr. O'Halloran, who accompanied him, came to the same conclusions.

In 1823, he produced "An Outline of hints for the Political Organization and Moral Training of the Human Race." Our author had, for a considerable time, devoted his attention to these subjects; but to frame a constitution of government, for the equal benefit of all mankind, and to propound a system of education, or moral training, calculated to make man what he ought to be, were undertakings too great and difficult for him, or, perhaps, for any other person, to accomplish. The outline of moral training promulgated in this work, will, in all probability, never be put to the test of experiment; and even if it were, it is not at all likely

that any system thereon founded, could long exist, or be attended with the important advantages ascribed to it by the author. The scheme of political organization he proposes, is bold and speculative: it cannot be said to be wicked or mischievous, but will be deemed, by many persons, as visionary and impracticable. Dr. Jackson was a sincere believer of the truths of Christianity, and he often refers to them in the present essay. In politics he was republican; and probably imbibed many of his political principles during his residence in America.

A much more interesting and valuable work, on a subject somewhat similar to the preceding, was published, by Dr. Jackson, in 1804; of which a second edition, entitled "A View of the Formation, Discipline, and Economy of Armies, with an Appendix containing hints for Medical Arrangement in Actual War," one volume quarto, appeared in 1824. This is a truly learned and excellent work. To princes and statesmen, to commanders, and military officers of every rank, and of every country, this is a most instructive and useful book. Yet, as the venerable author observes, "it did not obtain the notice of the public, and slept in its cradle for twenty years." In the second edition, the work was much enlarged, and its style and language improved. Dr. Jackson had benefited by a more extended experience. He had now served in three British wars, and had been often near the scene of active service; he had, moreover, several opportunities of seeing and examining the condition of most of the armies of the military powers of Europe This work may be said to contain an invaluable mine of knowledge of the subject upon which it treats.

Besides the works already mentioned, our learned and estimable author, wrote several articles in the periodical journals of the day. "A case of Sphacelation of the Intestine," in the Medical and Physical Journal, vol. 7. "On the virtues of the Spider's Web;" *idem*, vol. 21 and vol. 22. "On the virtues of Eye-bright;" *idem*, vol. 23; &c.

Dr. Jackson continued incessant in his application to study, and was engaged in making corrections of his earlier works, even a few days before his death. This event was occasioned by a paralytic affection, and took place at Thursly, near Carlisle, April 6th, 1827, in the seventy-seventh year of his age. It was the melancholy duty of the writer of this narrative, to attend him professionally in his last illness. After his decease the writer was presented with a copy of his works, from which the materials of the narrative have been chiefly collected. It is hoped that some one better qualified for the task, and furnished with more ample materials, will favour the world with a more ample account of his life and writings. The acquisition of professional knowledge for the benefit of mankind, was the ruling passion of this truly philanthropic person. Only a few weeks before his death, he made an offer to the director-general of the army medical department, to waive his rank, and proceed to Portugal, and perform the duty of a physician in the military hospitals, under the control of a junior. From the many perilous labours he underwent, in various countries, and the vicissitudes of climate to which he was often exposed, he must have enjoyed an uncommon share of health, and possessed great

strength of constitution, as well as strength of mind. To use his own words, "heat and cold, hunger, thirst, and other privations, not inferior in degree to those which fell to the lot of soldiers in the service of the field, were not unknown to him; and, though his physical powers never stood high, in a scale of comparison, he rarely yielded to the hardships, under which stronger men complained or sunk." He was of a middle stature, and of a slender frame, and had, what phrenologists consider incompatible with great talents, a small head. He was twice married. By his first wife he had two sons. About two years before his death he married Miss Tidy, sister of Colonel Tidy, and of Mrs. Charnley, of Newcastle-upon-Tyne. Dr. Jackson possessed considerable classical acquirements, and great facility in learning languages. He had a thorough acquaintance with the Hebrew, Greek, and Latin, as well as the French, Spanish, Arabic, and Gaelic languages. During the latter period of his life, he often employed himself in comparing the Bible in the original language, with the modern translations. He has left behind him the reputation of a man of great talents and extensive learning, indefatigable industry, and strict integrity, who was always assiduous in the right discharge of all the offices of public and private life. He was a man of great philanthropy, disinterestedness, and humanity; and was ever anxious for the promotion of medical science, and the melioration of the human race. History, perhaps, does not furnish us with a stronger instance of unbounded and unremitting zeal for the acquisition of useful knowledge, and of unlimited

beneficence in promoting the health and welfare of his fellow-creatures. A man who could leave his kindred and his country, to travel in foreign climes, amidst pestilence and death, for the purpose of relieving suffering humanity, and promoting medical science;—who, without reward, and at the risk of his own health, and of his life, would attend the sick, the dying, and the destitute, well deserves the admiration and gratitude, not only of his own countrymen, but also of the friends of humanity in every part of the world.

PART VI.

Medical Jurisprudence.

AN ACCOUNT

OF

THE EXAMINATION AND APPEARANCES OF A CORPSE,

FOURTEEN MONTHS AFTER DEATH,

AND OF THE

DETECTION OF POISONING BY ARSENIC.

BY JOHN ADDINGTON SYMONDS, M. D.

Physician to the Bristol General Hospital and Dispensary, and Lecturer on Forensic Medicine.

The following case of detection of poisoning by arsenic was attended by so many circumstances of high interest in medico-legal science, that the profession might justly bring a charge of neglect and supineness against the persons who were engaged in the enquiry, if a narrative of the facts were not placed in some permanent record. No depositary has appeared more fitting, in every respect, than the Transactions of the Provincial Association; and I trust my fellow members, and the public, will not consider me intrusive, if, with a statement of the facts, I interweave a few remarks and reflections.

I am well aware that the principal features of the case have already been presented to the profession, in the reports of the inquest and trial, published both in the medical journals and in the newspapers. But as medical evidence is in this country given *vivâ voce*, chiefly in answer to questions, and those questions bearing directly upon the judicial point at issue, it is manifest that observations of much value and interest must very frequently be omitted; a circumstance which would be far less likely to happen, if practitioners were obliged, like their brethren on the Continent, to furnish written reports of their investigations, in forensic cases, including not only the facts and inferences, but also the mode in which those inferences are drawn. In the present instance, the medical testimony was more ample than usual, but still did not contain all that was observed in the progress of the researches instituted; much less did it enter into certain enquiries which, however interesting to the professional investigator, would have been altogether out of place before a court of justice.

In presenting such of the facts as were not included in my own testimony, I could not do better, in some respects, than employ the words of the witnesses who related them; but this plan would be attended with the inconvenience of frequent interruptions, for the purpose both of addition and illustration; besides, that it would oblige me to follow the order in which the detail was made to the court, while a different one might be often much better adapted to the objects of this paper. Had I not been personally engaged in the enquiry, and, con-

sequently, a witness of the facts described in court by others, I should not have thought it right to give my own relation of them; but as my account will be taken from notes which I made upon the spot, and shortly afterwards reduced to nearly their present form, I think it better to present it, such as it is, more especially as it exhibits no discrepancy of importance with the statements given upon evidence.

In December of last year (1834) the relatives of Mrs. Clara Ann Smith, deceased, having had reason to suspect that the death of this person had been occasioned by poison, procured an order for the exhumation of the body, which had been interred on the 28th of October in the previous year. After the requisite precautions for correctly ascertaining the grave, the disinterment took place in St. Augustine's church-yard, on the 24th of December, 1834; that is, about fourteen months from the period of burial. Several professional gentlemen, and others, were present, besides Dr. Riley, Mr. Kelson, Mr. Herapath, and myself, who were engaged officially; the two former to conduct the autopsy,—Mr. Herapath to receive the stomach and intestines with their contents, for chemical examination,—and myself to witness the proceedings.

The grave was situated upon the south side of the church, and was about six feet in depth. The soil was a rich and somewhat humid mould, consisting of the red loam which generally covers the new red sand-stone in this district, mixed with a large proportion of organic matter. There was no water in the grave. The coffin having been raised by ropes, was placed upon a flat tomb stone hard

by, as there was no convenient room in the neighbourhood for making the examination: a circumstance which we should have less regretted had the weather been less inclement. The thermometer stood at two or three degrees below the freezing point. The wood was elm, about two-thirds of an inch in thickness, and bore no marks of decay; but there was a split along the middle of the lid for more than three-quarters of its length: an accident which, I am informed, very commonly takes place, from the weight of the superincumbent earth. The screws having been removed without difficulty, the removal of the lid exposed a corpse invested with a common shroud. A considerable quantity of dark-coloured water, which, doubtless, had entered by the fissure in the lid, was found collected at the bottom of the coffin, and was in contact with the back of the trunk and head of the corpse, to which parts it was then confined by the inclination of the stone on which the coffin was resting. The flannel lining of the coffin, where it was visible, was quite entire. The shroud, likewise, presented no hole or rent in the upper part, but gave way very readily when pulled; and the shift under the shroud was also in a state of integrity, though softened. Both these coverings had a soddened appearance. A quantity of fine mould lay upon the shroud along the chest and abdomen, having evidently fallen in through the rift in the lid. The head was covered with the remains of a cap, perfect anteriorly, but much decayed where it had been in contact with the water. The face of the corpse was shrunken, and of a dingy yellow colour; the nose depressed;

the orbits sunk; the cheeks collapsed and wrinkled; and the mouth looked as if open, in consequence of the retraction of the lips. The appearance, on the whole was not very unlike what would be presented by a wet bladder strained over a skull. The integuments of the trunk had a dull white aspect. The abdomen was considerably flattened, but the thorax had maintained its usual convexity. An incision was made on each side, through the integuments and cartilages of the chest, and continued through the abdominal parietes, and the flap was turned down over the pubes.

Abdomen.—The state of the alimentary tube excited the surprise of the by-standers, by its remarkable degree of preservation; every part being almost as distinct as if the inspection had been made at a very short period after death. The peritoneum was smooth, but rather less glistening than usual, and of a duller white. The intestinal canal appeared to contain neither fluid nor gas, and some of the convolutions were matted together. The omentum was firmer than in a recent body. The liver was shrunk to a fourth or fifth of its volume, and was of a very dark colour. The spleen was black, pretty firm, and, when cut into, stained the fingers with a sooty matter. The pancreas had lost considerably in bulk, but it had gained in consistence. Beneath it was found the splenic vein of usual firmness, and of a deep claret hue in its inner membrane.

Dr. Riley removed the stomach, with the lower portion of the œsophagus, the duodenum, the small and the large intestines, in separate portions; the rectum was taken out attached to the uterus and

ovaries. On cutting the duodenum, a bright yellow substance escaped, but in very small quantity: the divided end being carefully compressed by Mr. Kelson's fingers. The parts thus separated were placed in clean vessels, and committed to the charge of Mr. Herapath.

Thorax.—The diaphragm was entire, firm, and, in its muscular part, of a darker tint than ordinary. The pleuræ had undergone no visible change; but the left contained a few ounces of very dark red fluid. The viscera were extremely collapsed, and lay at the bottom of the cavity, from which, together with the smooth and shining appearance of the pleuræ, it was inferred that there had been no adhesions during life. The heart was so shrunk and flattened, that it had been accidentally cut across in the process of removing the œsophagus; its lining membrane had a reddish-brown colour, having evidently been dyed by a fluid of the same tint which was contained in its cavities.

The head was removed by a section between the third and fourth cervical vertebræ, in case it might be required for identifying the individual by the teeth. The hair was of moderate length, brown and grey. The scalp peeled off very readily, as well as all the soft parts of the face, being converted into a thick saponaceous matter. The same adipocirous condition existed in the external parts of the neck. The soft parts of the fauces, and the pharynx with its neighbouring tissues, were greatly decomposed, being soft, in some parts semi-fluid, and of a dirty ash colour. The vertebræ were held together by their ligaments, pretty firmly, but the temporo-maxillary articulation was very loose.

The company assembled round the corpse now dispersed, and several gentlemen accompanied Mr. Herapath to the medical school. As opportunities of examining corpses, under similar circumstances, have been rare, I remained behind, together with Mr. Stutchbury, the intelligent curator of our philosophical institution, to make a few further observations on the tissues. The extremities were white, firm, and rather plump. This condition resulted, apparently, from the partial conversion of the skin and subcutaneous cellular tissue into adipocire.* On cutting out a portion from the anterior surface of the thigh, I found the muscles beneath, claret-coloured, fibrous, and rather soft. The aponeuroses and tendons were strong and shining, and apparently quite unaltered. The capsular ligament of the knee-joint was smooth and moist, except on the posterior surface of the patella. This bone was bare on the anterior surface, the integuments in this part having been destroyed, a circumstance which I attributed to the absence of adipose tissue in this part, and the consequent deficiency of the elements for margaric and elaic acids. The hair on the labia pudendi had not fallen off. The nails of the hands were firm, but those on the toes were very loose; and the saponaceous matter at the soles of the feet seemed but imperfectly formed. The epidermis had, in this part, separated, and adhered to the

* On examining the specimen which I brought away with me, more minutely than was possible in the church-yard, I found that the skin had undergone very little change beyond that of condensation, excepting, also, that it was greasy to the touch; and that the cellular tissue beneath, though approaching in character to adipocire, was by no means so saponaceous as the substance on the face.

corresponding part of the stockings. The adipocire on the thorax was very thin, and more dry and cheesy than on the limbs: the anterior abdominal parietes consisted of little else, if we except a thin reddish layer of muscle, and the peritoneum. The cartilages of the ribs were soft, but quite elastic: they were very readily detached from their sternal connections. I removed the base of the heart, with portions of the great vessels. These were not only firm, but even more rigid than ordinary, and were chocolate-coloured on their inner surface. I also cut through the root of the left lung, and brought away about a third, attached to the above mentioned parts. The pulmonary parenchyma had lost its cellular structure and was very soft.

The persons employed to re-inter the corpse were now become impatient, and I was obliged to desist from any further examination, though much wishing to inspect the posterior surfaces. On leaving the church-yard, I proceeded to the medical school, where Mr. Herapath was just commencing his chemical researches into the contents of the stomach. This viscus had been cut open along the lesser curvature, and lay expanded on a clean deal board. The appearance which it presented was very striking. A thick and bright yellow coating, like paint, lay on the mucous membrane, particularly over the pyloric third: but it extended, more or less, with some small interjections of unstained membrane, to within two or three inches of the great cul-de-sac. A portion of this yellow matter was dried, then mixed with a little charcoal and carbonate of soda, and put into a reducing tube, and heated. A me-

tallic silvery-looking crust, characteristic of arsenic, soon made its appearance in the upper part of the tube. Mr. Herapath, by heating this crust, in contact with atmospheric air, converted it into crystals of arsenious acid, which yielded the usual precipitates to ammoniacal nitrate of silver, ammoniacal sulphate of copper, and sulphuretted hydrogen. This series of tests was repeated five times, for the satisfaction of various spectators, who went away fully convinced, not only of the detection of arsenic, but also of the skill of the operator. Mr. H. subsequently treated some mixed yellow-tinged matter, washed from the stomach, amounting to seventeen grains, in the following manner: thirteen grains were boiled in nitro-muriatic acid, which decomposed the animal matter, dissolved the phosphates, and the arsenic, and converted the sulphur into sulphuric acid. Ammonia having been added in sufficient quantity to supersaturate this acid, the mixture was acidulated with acetic acid, and filtered. A stream of sulphuretted hydrogen, passed into it, precipitated 4 grains of sulphuret of arsenic. Mr. H. stated, in his evidence, that the remaining 4 grains, out of the 17 grains of mixed substance, would have yielded another grain of orpiment.

Appearances of the stomach and intestines, after ablution.

Mucous surface.—In the cardiac extremity, the colour was dull red, or chocolate, diffused and uniform. There was no appearance either of distinct, injected vessels, or of red points. The texture was of the usual degree of firmness, neither softened nor

indurated; and exhibiting nothing like hypertrophy and thickness, on the one hand, or tenuity on the other; it was not in the least corrugated. The middle portion presented several indelible yellow stains, of indeterminate form; but in the pyloric third there were two remarkable patches, one about the size of the cut surface of a pigeon's egg, divided in its longitudinal diameter; the other somewhat smaller. Both of these spots had a well defined margin, and were equally visible on the serous surface. The mucous surface, examined carefully through a lens, was observed to be perfectly entire, so that the very tissue was infiltrated with the colouring matter. Here and there small spots on the disc appeared rough to the naked eye, and simulated abrasion; but, on more minute inspection, this appearance was found to result from the membrane being, in those places, more particularly loaded with the matter alluded to. The same remark applies equally to all the other yellow patches on the villous coat, both of the stomach and intestines. In those portions of the pyloric half of the stomach, which were free from the pigment, there was a dark grey appearance, almost approaching to black; but no inequality of surface, or interruption of continuity, could be discovered. Elevations from hypertrophied glands, or from extravasations, were anxiously looked for, but without effect. The lining of the pylorus was of a light grey or ashy colour, and had nothing else at all worthy of notice. The same may be said of the first two inches of the duodenum; but lower down, this bowel presented a dark stain, similar to that in the stomach, above

described. In the portion that lies in contact with the pancreas, there was a large yellow stain, the size of a dollar, across which an incision had been made in removing the part. About the commencement of the jejunum was another, the size of a shilling. The valvulæ conniventes were perfectly distinct, and in this spot infiltrated with the yellow substance; notwithstanding which, they floated freely in liquid. In this intestine, the villous membrane was of a faint red, but became quite pale in the ilium, which offered nothing remarkable.

In each of the parts described, the mucous membrane was sufficiently tenacious to be lifted by the forceps, in as large flakes as usual.

In the cœcum and colon, an ash-grey colour was noticed, differing more in degree, than in kind, from the dark stain in the pyloric portion of the stomach. The tissue was smooth, of its usual tenacity, presented no enlarged follicles or glands, was free from ulceration, and sufficiently transparent to render the submucous cellular membrane perceptible. The appearance of the latter tissue was peculiar; as seen through the mucous membrane, it gave me the idea of albumen coagulated in lines that intersected each other, and leaving distinct areolæ between them: the lines were of a dull pinkish colour. The ilio-cœcal valve was, if any thing, somewhat more developed than usual. The hue of the villous coat of the rectum approached more to a chocolate or slate colour, and was mottled with white spots of a circular form, depressed below the level of the surrounding membrane. Whether these depressions were owing to a loss of substance, or to the eleva-

tion of the rest of the tissue, was not easy to be determined; certainly they did not present the defined margins common to ulcers in this part. In my examination of the grey colour of the colon, I noticed that the stain was communicated to the white board on which the part was lying, and was very similar to that of soot diffused in water.

Serous surface.—The most remarkable appearance on the outer surface of the stomach, if we except the yellow patches already mentioned, was a black diffused stain, of irregular form, over the superior and anterior surface of the pyloric half, or that portion of the viscus which usually lies immediately under the left lobe of the liver. It corresponded, in its deepest part, with the dark stain in the interior. The colour was deepest at the circumference; and the general aspect was as if the viscus had lain in contact with some colouring liquid. The dark hue of the mucous lining of the duodenum, was likewise found to correspond with a similar coloration of the serous coat. In the part which was situated under the liver, I fancied that I could detect a similar correspondence between the colour of the serous covering of the colon, and that of its internal membrane, particularly in the ascending portion. The mesentery was firm and healthy, and matted in a few of its convolutions. Some opaque white patches, however, were noticed, which, probably, originated in enlarged or otherwise altered glands. It presented one or two slight yellow stains, which must necessarily have been acquired by imbibition. I noticed a similar appearance on the serous covering of the

ilium, but the colouring matter had not transuded to the villous coat. In the meso-colon, also, there was one very bright yellow spot of circular form.

The appendices epiploicæ were perfectly distinct, but shrunken, hard, and somewhat cheesy.

The odour of all the parts above described, was *sui generis,* removed equally from their smell when examined in a fresh body, and from that of putrefaction. It was remarkably persistent: I never had more trouble in getting my hands and clothes free from it; and the same observation was made by others.

The uterus and ovaries were very small; the latter barely distinguishable. The mucous lining of the vagina, and the os tincæ, were perfectly natural.*

Contents of the cranium, &c.

I examined the head in the presence of Dr. Dick and Mr. Kelson, at the institution, on the morning of the 27th instant. It had lain in a macerating tub since the day of exhumation. The soft parts were much in the same state as before described, excepting that some of the tissues at the base of the skull were somewhat more decomposed. The greater part of the scalp, and coverings of the face, had been removed in the church-yard; but what was left was completely saponaceous. The orbits presented no trace of eyes, they contained nothing but adipocire. There was no vestige of muscular

* Preparations of the stomach, and of portions of the duodenum and jejunum, have been made in a very masterly manner by Mr. Stutchbury, and will be deposited in the museum of the medical school.

aponeurosis in the temporal fossæ, and the pericranium was entirely gone. The sutures were easily recognized, but not less filled up than is usual at the age of the individual. The contents of the cranium were found to occupy not more than three-fifths of the cavity. The vacant space was in the back part. The dura-mater was in this situation, however, quite entire, and laterally also; but in the region corresponding to the anterior lobes, it was found wanting, and here the cerebral matter was semi-fluid and putrilaginous. On removing, with scissors, the remains of the dura-mater, it was noticed to be quite as resistent as usual, and was smooth and shining on its inner surface. The lining membrane of the lateral sinuses had a dark red tint. The brain thus exposed was in the form of a globular mass, distinguishable into hemispheres, but barely into lobes. The pia-mater was clearly recognizable, and was traversed by one or two bright red veins. Its texture was so tender that I could scarcely separate it from the mass which it invested; but in my attempts to do so, the tomenta cerebri were very perceptible. The appearance of the cerebral mass was not unlike that of Stilton cheese, and its consistence extremely soft; but a section demonstrated the white and grey matter with perfect distinctness. The consistence prevented me from making any observation on the other parts. The tentorium cerebelli was quite firm, but beneath it was a pultaceous mass, in which it was vain to search for layers of cerebellum, tuber annulare, or any other nervous organ belonging to this region.

In separating the atlas from the occipital con-

dyles, I found great resistance from the surrounding ligaments.

Observations.

The first remark that I shall offer upon the above appearances will have reference to the singular state of preservation observed throughout the body. Were it not that so little certain information has been as yet ascertained as to the period required for the decomposition of the body, a process affected by so great a number of external circumstances, that all attempts to establish any general rule with regard to time, appear nearly hopeless, we should be disposed, in accordance with the generally received ideas upon the subject, to conclude at once that the integrity of the body must have been owing to the operation of some unusual agent; and the discovery of arsenic would appear to furnish the very agent suspected, not only because this substance is known to exert an antiseptic influence over animal matter with which it is in immediate contact, but because the researches of certain investigators, particularly in Germany, seem to indicate that, in the bodies of persons poisoned by arsenic, those chemical changes which otherwise would take place, are arrested or modified. For a knowledge of these discoveries, I am indebted to Dr. Christison's work on poisons; and as I presume that this admirable volume is in the hands of every British practitioner, it is not necessary to introduce an abstract of them here. I should feel little difficulty in at once placing the present instance in the class of facts alluded to, but for two circumstances—first, that in the bodies whose pre-

servation has been attributed to the presence of arsenic, the tissues appear to have been converted into a hard, dry, cheesy substance, not exactly corresponding with the condition of the corpse just described; and, secondly, that the coffin contained water, which can scarcely be conceived to have been inactive in such cadaveric changes as were taking place. It might, perhaps, be said, that the difference as to moisture was the result of the presence of water; or, on the other hand, that the water had itself assisted in the conversion of the external parts into adipocire, and thus tended to retard or modify the putrefaction of the internal organs. The difficulty of coming to any definite conclusion upon the subject, is enhanced by the knowledge of the extraordinary preservation of some bodies, where no particular modifier of the usual chemical affinities could be ascertained. Thus, in the elaborate "*Exhumations Juridiques*" of MM. Orfila and Lesueur, there is an account of two bodies disinterred from a burying-ground at Valenciennes, (which had no peculiarity of soil or situation) after the lapse of fifteen years; their preservation was so perfect, that the inspectors were enabled to determine, in one of them, that the individual had not died a violent death, but of a peripneumony, complicated with a gastro-enterite; that he had been bled in both arms, and that the orifice was of a bright red.* Such instances as these, however, we are bound to believe must be very rare. In other cases, the decomposition of the body takes place more rapidly. Thus, the same investigators give examples in which the

* Exhum. Jurid. T. 1, p. 271.

frame was reduced to a mere skeleton in fourteen months; thus demonstrating the mistakes of M. Burdach, once considered an authority upon this subject, and who, in common with others, considered several years to be requisite for the complete destruction of the soft parts. There seem to be no bounds to the diversities occasioned by age, sex, constitution, habit, leanness or obesity, the mortal disease, deposit of the ova of insects, the interval between death and burial, the soil, depth of the grave, coverings of the body, &c. &c.

After carefully collating the different cases detailed by these authors, I have been unable to learn anything more than the alterations which the tissues undergo in various circumstances; and certainly have not found any combination of circumstances corresponding to those in which the body of Mrs. Smith was discovered. It is true that there are two cases of poisoning by orpiment described by M. Lepelletier, in which the abdominal organs, as we shall see presently, were in a state of preservation, very analogous to what we have described; the rest of the body was, however, by no means so perfect, though each had been interred a much less considerable length of time than in the case before us; but the individuals, as compared both with each other, and with Mrs. Smith, differed in age and sex, had lain different periods in the ground, and were differently protected by coverings from surrounding agents. In all the cases related by the authors just mentioned, in which the periods of interment approached that of our present instance, the defence of the body had been inferior to that of the latter. Yet it would be

scarcely reasonable to attribute the preservation to this circumstance; which could only be expected to make a difference in the *degree*, not in the *kind*, of alteration; but with the exception of some of the soft parts of the neck and of the soles of the feet, there did not appear, in Mrs. Smith's case, to have been even a *commencement* of common putrefaction. If, then, the external protection does not solve the question, can we explain it by the presence of the water? How long this liquid had been in the coffin, it is impossible to say with precision; but as the grave was comparatively dry, and the three months previous to exhumation had been remarkable for the small quantity of rain, we may conjecture that it had existed there for several months. But supposing it had entered the coffin soon after the interment, will it account for the state of the body? I think not: because it is a well known fact that water is extremely favourable to putrefaction; and that, although it facilitates the formation of adipocire, it is only by a series of processes which destroy the characters of the tissues and reduce them to a homogeneous substance. But it was only upon the head and face that the latter kind of change had taken place; and certainly there was, in those parts, no distinction of tissues. In the extremities and trunk the identity of the tissues remained, and the changes they had undergone had reference to little else than consistence and colour, with the exception of the skin and subcutaneous cellular membrane; the former of which had a somewhat unctuous feel, while in the latter there was a deposit of matter corresponding to adipocire. In this part it seemed

as if the substance in question had been formed in the meshes of the cellular tissue; certainly there had been no melting down, so to speak, of the neighbouring parts for its production. It is necessary also to observe, that though it is impossible to say how much water might have been, at any previous time, collected in the coffin, and although we cannot define the exact boundaries of the parts that were actually in contact with the fluid, yet it is certain that the parts that were in the highest preservation, viz. the anterior thoracic and abdominal parietes, and the anterior surface of the thighs and legs, could not have been touched by the fluid which was discovered. The condition of this body, then, being peculiar in kind, as well as in degree, and the mode of its protection from outward agents, and the presence of the water being inadequate to the explanation of its preservation, there seems considerable reason for ascribing this effect, in a great measure at least, to the mode in which death was occasioned. The want of correspondence, as to consistence and dryness of the external parts, with other cases exemplifying the antiseptic operation of arsenic, is, we think, insufficient to do away with the probability, more especially as the state of the great cavities was closely analogous. Dr. Christison, after relating the cases before alluded to, observes, with much sagacity, "if the preservation of the bodies is not occasioned by some accidental collateral cause, (a mode of accounting for the phenomena which is hardly admissible) this property of arsenic must depend on its causing, by some operation on the living body, a different disposition and

affinity among the ultimate elements of organized matter, and so altering the operation of physical laws on it."* Such, I cannot but believe, must have been the operation in the case before us. That in Lepelletier's two cases already alluded to, of exhumation after poisoning by orpiment, the preservative effects of this substance on the body in general were somewhat deficient, may be rationally explained by the unfavourable circumstances under which the corpses were deposited in the ground; for instance, without being enclosed in coffins. To these cases a general observation by Harles (an author quoted by Christison) will be found not a little apposite: "It would be absurd to ascribe to arsenic the power of preventing putrefaction in all circumstances whatsoever,—a power which those who make use of it for preserving skins, know very well it does not possess, and a power possessed by no antiseptic whatever, not even by alcohol."

As the time and space allotted to the execution of this paper prevent me from expatiating farther upon the condition of the tissues in general, I shall at once proceed to offer some brief comments upon the appearances in the alimentary canal. From the chocolate-colour in the cardiac extremity of the stomach, it need scarcely be observed that no legitimate inference can be drawn, as to whether it had been the subject of morbid action. It is possible that the accumulation of blood in the part, resulted from inflammation; but it is just as likely that it was a mere cadaveric hyperæmia. I have mentioned, in my description of the stomach, that there

* Christison on Poisons, p. 317.

was a dark or blackish stain, both on the inner and outer coat of this organ. The cause of this colour I was at first at a loss to discover; but among the many minute observations in the cases detailed by Orfila and Lesueur, I met with the following statement, which fully explained the appearance in question: "*En incisant l'abdomen, on voit les viscères abdominaux, et on est frappé* de la teinte noire que présentent ceux d'entre eux qui avoisinent le foie, *tels que l'estomac, la portion droite du diaphragme, &c.; cette nuance est evidemment due à la transudation d'une matière noire qui colore le foie.** The duodenum, it will be remembered, presented a similar appearance, which is to be accounted for in the same manner. That some fluid must have exuded from the liver was evident, from the great diminution in bulk which this organ had undergone.

The yellow patches in the stomach, duodenum, and jejunum, so closely corresponded to the description of certain appearances in Lepelletier's cases, that I cannot resist the temptation of quoting his own words. In one case he remarks: "*La matiere jaune semble comme identifiée avec la substance des parois gastriques, et forme des taches épaisses, qui s'aperçoivent aussi bien à la surface externe qu' à l'interne. Il existe évidemment injection des vaisseaux capillaires, par une grande proportion de la matiére jaune, à l'état de division extreme. . . . . Le même caractère de cette pénétration de la substance jaune se trouve dans plusieurs poins de l'intestine grêle, et même du mésentère.*"† In the other case, when speaking of the stomach, he observes: "*Ses parois,*

* Exhum. Jurid. t. 1, 210. † Exhum. Jurid. t. 2, p. 321.

dans toute leur épaisseur, et dans une ètendue de cinq pouces sur quatre, offre une tache jaune citron, apparente à l'exterieur, et à l'intérieur. L'organe semble impregné dans ce point d'une matiere colorante," &c. The author appears doubtful whether this yellow infiltration is to be considered a vital or cadaveric process, but inclines to the latter view. That the effect in question ought to be attributed to mechanical transudation, appears, in my own judgment, sufficiently evident; first—because there are no facts to warrant our believing that such an impregnation could take place in living tissue without chemical action; secondly—because the opinion once entertained that arsenic operates chemically upon the organs is entirely and justly exploded; and thirdly—because, in my experiments upon animals, I have discovered no appearance at all resembling the effect alluded to, notwithstanding the orpiment lay in contact with the villous membrane, a much longer time before death than in the case of Mrs. Smith.

It is almost superfluous to point out the entire absence of any proof of vascular disturbance in the stomach, and small intestines; such derangements might have taken place, and afterwards disappeared. But who can determine the precise alterations that might or might not have occurred in the distribution of fluids through capillaries and permeable tissues, during a period of fourteen months? Had the structure of the organs undergone any vital lesions, there is every reason to believe that the latter would have been exhibited as distinctly as in the most recent corpse.

The appearances in the cœcum and colon did not enable me to form a positive opinion respecting their condition previous to death. Dr. Riley, however, who has cultivated pathological anatomy with great zeal and success, considered that there were decided traces of chronic inflammation recognizable by what he pronounced to be "*coloration ardoisée.*" To me the tint did not appear to correspond so much to the epithet "*ardoisée,*" as to our own adjective "ash-grey." But had the colour struck me in the same light, I could not, after the lapse of so long a period from the time of death, have felt satisfied that it was necessarily assignable to a vital change in the part, more especially as many eminent pathologists, particularly MM. Rigot and Trousseau, have been led, by their researches, to believe that this colour may result, even in more recent cases, from causes altogether cadaveric; such, for instance, as the action of sulphuretted hydrogen upon the blood contained in the capillaries of the submucous cellular membrane. The hue in question struck me as being similar to, though more intense, than what I have often observed in the colon, both of the human subject and of the inferior animals, and which I have attributed to infiltration of the membrane with the colouring matter of the fœcal contents. I was more inclined to the opinion that the colour in the parts alluded to, might have owned some such cause, by a circumstance already mentioned, namely, that the membrane communicated a thin sooty stain to the board upon which it was spread. But the state of the rectum was certainly much less equivocal; the inequality of its mucous

surface, existing in a kind and degree which it would be difficult to account for fully by any supposable change after death, was decidedly favourable to Dr. Riley's opinion respecting the existence of chronic inflammation. It will be seen that such accounts as we have been able to collect regarding the symptoms of the disease, during the last few days of her life, were confirmatory of the suspicion that she had laboured under some enteric disorder previously to the exhibition of the arsenic.

The most remarkable circumstance exhibited in the condition of the contents of the cranium, was the perfect integrity of the dura mater, in some situations, and its entire destruction in others. This fact was no less difficult of explanation than the decomposition of the anterior cerebral lobes and of the cerebellum, while the posterior and middle lobes still retained a certain degree of firmness. The condition of the whole mass was certainly very inferior, with regard to preservation, to that of the viscera, in the other cavities; a fact which I was not prepared to expect, as the protection of the former is more complete, in consequence of the bony structure of the walls of the cavity. MM. Orfila and Lesueur state that it has very frequently happened to them to find relics of the brain, when not a trace of viscera could be discovered in the thorax and abdomen In the present instance, the colour and consistence of that which remained, corresponded, as well as the diminution of volume, to the descriptions of those authors.

There are some kinds of organic lesion of the brain, which I am persuaded might have been re-

cognized, had they existed in that part of the organ which retained its solidity. Nor do I entertain any doubt, as I stated in my evidence, that an extensive extravasation of blood would have been indicated, (if such an event had taken place,) by the colour of the contents. It has been already mentioned, that we were much struck by the appearance of two or three veins of the pia mater, which were of a vivid red colour.

The first medico-legal enquiry arising out of the above investigation, was, whether any thing had been found to indicate the cause of death; and I need scarcely remark, after what has been already said, that the pathological appearances afforded nothing but negative evidence, and that the discovery of the poisonous substance itself was by far the most important fact, with reference to the judicial question. As soon as the metallic crust exhibited itself on the interior of Mr. Herapath's test-tube, information was sent to the coroner, who issued a warrant for the apprehension of the person upon whom the suspicions rested. The only question in this stage of the enquiry, was, how far the presence of this substance might be presumed to have been the cause of dissolution. Was it sufficient, *per se*, in the absence of proof of any other deleterious agent, to account for death? Had it been introduced during the life of the individual? The answer to the latter question could not but be affirmative, as the parietes of the trunk were entire; or if it were possible to conjecture that any one might have been ingenious and diabolical enough to have in-

jected the arsenic by an elastic tube, passed along the mouth and gullet into the stomach, in order, at so remote a time, to support an imputation of poisoning, we still should find it difficult to explain how the matter could have reached the jejunum. The deleterious properties of the substance being admitted, was the quantity sufficient to occasion death? Had it been necessary to have answered this question, with reference to the quantity of arsenic which Mr. Herapath actually produced, the reply would have been all but affirmative. The substance was orpiment; supposing its base to have been arsenious acid, which was converted into a sulphuret, by the action of sulphureted hydrogen in the body, in accordance with actual observations of this kind by Christison, the discovery of five grains was nearly conclusive; or supposing that it had been given in the form of orpiment, as sold in the shops, the answer would have been the same, since the latter preparation contains more than nine-tenths of arsenious acid.* But there was no necessity for limiting the question to so small a quantity, because much was wasted in the tests, and in the liquids employed in the ablution of the parts, while a considerable quantity remained incorporated with the tissues. It was thought probable by many, as well as by myself, that there must have been as much as a drachm altogether in the stomach and intestines. When pressed in my examination to state what I believed to have been the smallest quantity, I said that I felt persuaded that there could not have been *less* than half a drachm. The substance and the quantity, then,

* This subject will be recurred to in the sequel.

being adequate to a fatal effect, did it actually produce this result? In the absence of any proof whatever, that any other fatal cause was in operation, there could be but one answer to this question. Nor do I think that the case would have been different, even had we discovered the traces of organic disease in some vital organ; since the experience of every practitioner must have taught him, that the fatal results of such lesions have no determinate time, while the period of action for a poison is far more definite, and consequently, where both are discovered, it is reasonable to ascribe death to the latter, though there is a remote possibility that the effect of the former might have accidentally taken place before the poison had had time to complete its work. But there is scarcely any, even the most acknowledged mortal agent, which is not liable to the exception of such a possibility. On finding the appearances of intense enteritis, the inference that this disease was the cause of death might be questioned, if nothing was known of the history during life, on the possibility that some sudden external cause, such as a concussion, or a stroke of lightning, might have cut off the patient. Such refinements are, however, insufficient to divert the belief from the more obvious conclusion; the highest degree of probability in such cases must amount practically to absolute certainty.

That arsenic, then, had occasioned the death of the deceased, was the opinion formed by the medical witnesses upon the results of their examination of the body. How far we were supported by the account of the occcurrences during the last hours of

the individual's life, will appear, in part, from the following abstract of the evidence of two persons who attended upon the deceased, and partly from the confession of the culprit, made after her condemnation. Mary Ann Allen, the principal witness for the prosecution, stated, among many other circumstances, the greater part of which belonged to the proof of administration on the part of Mrs. Burdock, and which, therefore, need not be inserted here,—that she saw the deceased, for the first time, on the evening (Thursday) before her death; that she was warned by Mrs. B. never "to eat any thing after Mrs. Smith;" that the deceased was in weak health, and kept her bed, but was not very ill;* that on the following morning, the deceased expressed herself as being much better, and hoped to go down to her parlour on the ensuing Sunday; that the deceased attributed her indisposition to a cold taken by walking out on a windy day; and that nothing remarkable happened till the evening, when Mrs. Smith appeared more poorly than previously, and declined taking some gruel, because her mouth was sore. In the course of the evening some gruel was administered, witness having previously seen a yellow powder mixed with it in another room, which powder she was told was medicinal: but she stated that, before this addition, the gruel had a reddish colour. About half the quantity in the basin was drunk, and shortly afterwards Mrs. Smith appeared in great pain, "rolling about the bed in great

* At the coroner's inquest, this witness deposed that the deceased laboured under diarrhœa, and that the evacuations were very dark-coloured.

agony;" she did not vomit, but spat a bloody matter: after a time she became quiet, and seemed asleep. No other symptoms were mentioned by this witness, except that, after the interval of quiet, the deceased raised her head convulsively, struck it against the head-board and expired. Witness had no means of computing time, but supposed that about two hours had elapsed between the taking of the gruel and the death. There is reason, however, to believe that, upon this point she was mistaken, and that the time was much longer. Another girl, Charlotte Thomas, who had been employed in a similar capacity to that of Allen, for nine days previously to the engagement of the latter, and who was the principal witness for the defence, declared that the deceased had a very sore mouth;* was in the habit of using a gargle, and spat a great deal of blood. This witness left Mrs. Smith in consequence of her own health being seriously deranged; and it is deserving of notice, that among her ailments was a sore mouth.

I need scarcely remark, that very little exactness could be expected in the detail of symptoms observed, fourteen months previously, by Allen, a person not more than fourteen years of age at the time, and unaccustomed to wait upon the sick. I heard her deliver her evidence both at the inquest and the trial, and gathered from it that Mrs. Smith, previously to taking the gruel, as she called it, (because it had been so designated by the culprit) was very unwell, but became much worse soon after.

* At the inquest she spoke of "holes" in the mouth and gums, and great swelling of the face.

Supposing her account of the time to have been correct, and that the arsenic had been administered for the first time in the liquid mentioned, the fatal event must have taken place sooner than in any case actually upon record. Dr. Christison mentions three hours, as the shortest period that he has met with; but he alludes to a case tried at Warwick, mentioned by Mr. Evans, of Lewes, in which death was said to have occurred in two hours. In the present instance, as I have already intimated, there was reason to think that the time had been miscalculated; but even if double the period had elapsed, it was extremely brief, and the case must have been classed among those in which death is brought about by the remote action of the arsenic upon the contractility of the heart. The absence of vomiting would tend to corroborate this opinion, and, perhaps, also, the want of any signs of irritation in the *post-mortem* appearances. It was, however, quite open to conjecture, that a dose of the poison might have been given previously; and my professional brethren, and myself, were strongly inclined to this opinion; though, if evidence had been brought to shew that this could not have been the case, it would not have altered our conviction respecting the cause of death; for, without adverting to the fact that there is an individuality in every case, which may render it an exception to all general rules, there was nothing unreasonable in believing that an irritant poison would operate more rapidly upon a person already enfeebled, especially when it was known that the dose was considerable. In the defence, no attempt was made by the prisoner's counsel to elicit any doubt upon this subject.

The account given of the previous condition of the deceased, very naturally suggested the idea that she had been under the influence of mercury, and it was not uncharitable to conjecture that the individual who had administered the arsenic, had previously made an attempt with corrosive sublimate. It was remarkable that the girl Thomas left with a sore mouth, and that Allen was particularly enjoined not to taste any thing after Mrs. Smith, an injunction which probably had either not been given to, or had not been followed by Thomas. The opinion upon this subject, formed by most of the professional men who heard the evidence, is further supported by a fact which I have received from credible authority, namely, that Mrs. Burdock had frequently purchased, at a chemist's shop, small quantities of corrosive sublimate, under the pretext of using it medicinally. The diarrhœa, testified by both the witnesses alluded to, adds weight to the suspicion; and not the less so, if the *post-mortem* appearances in the large intestines indicated chronic inflammation.

After her conviction, Mrs. Burdock, in a somewhat scanty confession, or declaration, to a woman employed to attend her, stated that arsenic had been given to the deceased on the day before her death, and a larger quantity on the following evening, as the former dose appeared insufficient. The only discrepance between her statement and that of Allen, was, that the liquid was thickened milk, and not gruel. She made no remarks, that we have heard of, upon the symptoms of her victim. By this declaration, the peculiarity as to the shortness

of time occupied in the action of the poison, is done away with; but it is somewhat remarkable that nothing should have appeared upon evidence, tending to show that Mrs Smith laboured under irritatation from the effects of the first dose, (unless we admit that the diarrhœa was more recent than is intimated by other testimony,) or that she was worse than usual until the following evening. Some may, perhaps, conjecture that vomiting might have partially removed the substance, though there is no evidence of such an occurrence. I should be more disposed to think that there was a deficiency of observation, or of memory, upon the subject, which is quite conceivable with reference to so young an attendant as Allen, and perfectly compatible with the value of her testimony upon other facts, of which she was more capable of taking cognizance and preserving the recollection.

I shall now make one or two remarks upon the poison which was used in this case. It has been already stated, that the substance detected in the body was the yellow sulphuret; but it did not follow that this was the identical preparation that had been administered, because arsenious acid may be converted into the sulphuret in the dead body.* It appeared in evidence, however, that the substance purchased and used in the case, was called yellow arsenic by the chemist who sold it. Having pro-

* Dr. Christison was the first to point out this fact. In the "*Exhumations Juridiques,*" (t. 1, p. 221) already cited more than once, there is a case in which yellow spots in the cardiac extremity of the stomach were observed, and grains of white arsenic in the ilium. No remark is made upon the former appearance, but we cannot doubt that it resulted from the conversion alluded to.

cured a specimen of this preparation, in order to try its activity upon animals, I found that it did not correspond in colour either to common orpiment, or to the spots in the stomach. It inclined more to red than yellow, and in this respect resembled realgar, but was still not so red as the latter compound. When mixed with gruel it gave a rich golden tint; with milk it inclined somewhat more to yellow; and with water the colour was a dull orange. It consisted of a fine powder, not easily miscible with liquid, and a great number of little grains and lumps. Some of the latter, when freed from the powder, were found to be orpiment, and others white arsenic. I subsequently examined the contents of the chemist's jar, and found in it several large lumps, some of which were cakes of orpiment, but most of them were of an irregular crystalline appearance, consisting of arsenous acid, streaked with yellow lines. I have not been able to ascertain the precise mode of manufacturing orpiment in this country, at the present time. On the Continent, it is made by subliming sulphur and arsenious acid together; and the analysis of the substance given by M. Guibourt, is 94 parts of arsenious acid to 6 of the sulphuret.* In Dr. Mead's time,† "yellow arsenic was prepared by subliming white arsenic with the addition of a tenth part of sulphur. The red," he adds, "differs from the yellow only in this, that a greater quantity of sulphur is added, together with a particular kind of a red cobalt called kupfer nickel." It is not probable that any

* *Dict. de Med. Pratiq. et de Chirurg.* Art. Arsenic.

† Mead on Poisons, p. 218. 1745.

important difference has been made, if any, from the above proportions. The druggist informed me that the substance in question was part of an old stock that he had taken from some other person in the trade; and I conjectured that it had probably been a sort of refuse left at the bottom of the alembic, after the sublimation of a certain quantity in a pure state, to be used as a pigment; and that this residuum had been broken up, and kept for coarse purposes, such, for instance, as that of poisoning vermin. Mr. Herapath analysed the preparation, and found it very variable, from the irregular intermixture of the grains of arsenious acid and orpiment. His general result was, that 100 parts of the red powder contained 79 of arsenious acid and 21 of realgar. He found that a stream of sulphuretted hydrogen gave it a bright yellow colour.

The comparative inertness of the native or pure sulphurets is only what might be expected from their composition. When they act deleteriously, it is, probably, not till the metallic arsenic has derived oxygen from the organs or their contents, or from the liquid in which they may have been administered: we owe to M. Courdemanche the discovery of the important fact, that sulphuret of arsenic and water may, by the decomposition of the latter, yield arsenious acid and sulphuretted hydrogen.* With the yellow arsenic of commerce, M. Renault killed a small dog in five hours: the dose was 4 grains. A larger dog was killed in nine hours, with three grains. When applied to a wound, in quantities of a drachm, 18 grains, and 8 grains, it caused death

* *Orfila—Leçons de Med. Leg.* t. 3, p. 177.

in from fifteen to eighteen hours.* No precise experiments, that I am aware of, have been performed with *artificial* realgar. Orfila states, in general terms, that a few grains are fatal "*au bout d'un temps variable;*" and relates the following case, taken from the *Ephemer. Nat. Cur.*: "*Une femme mourut dans l'espace de quelques heures, après avoir eprouvé des tranchées violentes, pour avoir mangé des choux, au quels on avait mêlé une certaine quantité de cette substance.*" It is difficult to understand how it should be so active, if the analysis given by M. Guibourt,† on the authority of M. Laugier, be correct, viz. that only 0,015 of its weight consist of arsenious acid.

In order to ascertain the activity of the particular substance in question, I made the following experiments:

Experiment I.—Fifteen grains, mixed with gruel, were injected into the stomachs of two rabbits, by means of a flexible tube passed down the pharynx. Two days afterwards they appeared quite at ease, and ate greedily of hay, which they had been allowed from the time of the operation. The smaller of them was killed: the stomach was found very remarkably corrugated, but presented no other morbid appearance; it was full of vegetable substance, with which a good deal of the arsenic was involved, so that very little could have been at any time in contact with the mucous surface. None of the arsenic was found in the intestines.

Experiment II.—To the other animal 2 scruples

* *Orfila—Toxicol. Gen.* t. 1, p. 450.

† *Dict. de Med. et Chirurg. loc. cit.*

more were administered in the same manner as before; and in order to preserve the circumstances unaltered, it was not denied the same food as had been allowed on the former occasion. Eleven hours afterwards it betrayed no uneasiness; but in twenty-hours it was found stiff and quite cold, and had, probably, been dead some hours. It was opisthotonized, and was surrounded by liquid dejections. The stomach was distended with food, and not corrugated. The mucus was so thick as to resemble a false membrane, especially where there was most of the arsenic. Near the pylorus, I found a large patch of greyish black extravasation under the villous coat. The pharynx was highly injected.

Experiment III.—Two scruples, with gruel, were injected into a third rabbit. In the operation some resistance was felt, and part returned by the mouth. The animal died in three hours, opisthotonized, having evacuated the bladder and rectum. On dissection, the stomach, which had been supposed to have been empty, was completely full of food, and probably from this circumstance had resisted the entrance of the injection. The œsophagus had given way, and the greater part of the poison was found in the right pleura. Whether the animal died of the injury, or in consequence of the more rapid action of the poison on the surface to which it was applied, I am unable to determine, but incline to the latter view, knowing what extensive and serious injuries these animals are capable of receiving with impunity.

Experiment IV.—Having caught a rat in a convenient trap, I placed late at night, within his reach,

fifteen grains of the arsenical preparation, spread between two thin slices of bread and butter. He nibbled a piece the size of half a pea, but declined the rest, as I found next morning. I then mixed some boiled potatoe with the same quantity, and placed it in the trap. The animal appeared less nice, or more hungry than before, and nibbled voraciously. Twelve hours afterwards I found it dead, quite cold, and opisthotonized; there were mucous liquid discharges. Half the mixture was consumed, so that he had taken eight or nine grains of the arsenic. The stomach contained a little pulpy matter, and was in its pyloric half highly injected; in this part there was also a small patch of extravasation. The cardiac portion in this animal is too strongly defended by epidermis, to be very susceptible of irritation.

Experiment v.—Thirty grains were given to a good-sized dog, in a piece of meat. He was allowed no food. In three hours he betrayed signs of uneasiness, and vomited, after which he appeared to recover himself. The following day he was tolerably brisk, and he then took a similar dose, but rejected it almost immediately, and entirely. Fifty grains were administered at half-past one, p. m. twenty of which were in the form of two boluses, and the rest diffused in water. The œsophagus was tied directly afterwards, with the assistance of my friend Mr. Fripp. Signs of abdominal irritation soon appeared, such as efforts at vomiting, and excessive diarrhœa. He died at half-past seven, or six hours after taking the last dose. The stools were of the same colour as the arsenical substance,

and the boluses were passed entire, so that the quantity contained in them had probably not contributed much to the effect. The pharynx and œsophagus were found healthy. The stomach presented hour-glass contraction and corrugation of the mucous membrane of the cardiac extremity: this part abounded in dark red extravasations, and contained two small coagula, besides a great quantity of mucus, in which some yellow matter was involved. The duodenum and jejunum were highly injected, but the ilium much less reddened. The ilio-cæcal valve exhibited three or four remarkable crimson extravasations; the colon and rectum were also studded throughout with similar patches, and extremely wrinkled.

Experiment VI.—Thirty-five grains, diffused in water, were given to a smaller dog, at two p. m. and the œsophagus was tied. The animal, after suffering greatly from pain, retching, and diarrhœa, expired in nine or ten hours. Similar appearances were found in the alimentary canal, to those in the former experiment.

The above experiments fully satisfied me that the arsenical compound, administered to Mrs. Smith, was a poison of great activity.

It may not be improper to state, that I have instituted a few experiments, intended to illustrate the operation of arsenic, in retarding or modifying the usual changes in animal bodies, though I confess that they have not, as yet, yielded any conclusive results. In the middle of January, I buried some rabbits, one of which had been killed by the preparation just spoken of; another by white ar-

senic; and a third by a blow on the occiput. The bodies, covered with hay, were deposited in a box, four feet deep, in a soil of red loam. At the end of three months they had all undergone considerable softening, and decomposition in the external part; but the internal organs were quite distinct, and, for the most part, of tolerable firmness. The only difference presented, was in the animal which had received the yellow arsenic. It was that in which, as I have already mentioned, the poison had escaped into the pleura; a very small portion only, having reached the cardiac extremity of the stomach. This viscus was extremely soft, and all but destroyed, in every other part but that with which the mineral was in contact. The thoracic organs, on the other hand, were almost as fresh as if the animal had been just killed; and, certainly, very different from those of the rabbit which owed its death to white arsenic: the stomach of the latter was entire, but by no means remarkable for firmness.

Within the box which served as a coffin for the rabbits, I had placed a smaller box containing three portions of the alimentary canal of a person who had died of fever. In one of these I had enclosed a quantity of yellow arsenic mixed with gruel; in another some white arsenic similarly mixed; while the third was left empty, for the purpose of comparison. These parts were examined at the same time as the rabbits, but presented very little difference from one another; they were all firm, and their coats distinguishable; the folds of that portion which did not contain any arsenic were more matted, but this circumstance admits of an easy

explanation, by their being empty. At the end of January, I buried, in another box, three portions of the alimentary canal of a dog, which had died of "the distemper," under circumstances similar to those of the last mentioned experiment. The result, however, was different; for while the parts which contained the arsenic were found, on their disinterment, in a state of complete preservation, that which had been left empty was much advanced in putrefaction.

In none of these cases had the yellow substance penetrated into the tissue, as in the instance above described.

Little or nothing, I am aware, is added, by the results of these experiments, to our knowledge of the influence of arsenic upon cadaveric changes. I have, however, thought it better to mention them, as they may, perhaps, serve as objects of comparison for future investigations upon the same subject. As opportunities offer themselves, I shall endeavour to prosecute the enquiry; but the multiplicity and variety of the circumstances which modify the changes alluded to, are so great as to make it a matter of considerable difficulty to arrive at any definite conclusions. Observations upon the natural decomposition of the human body can, of course, be very rarely made; or were the opportunities less uncommon, it would be far from easy to find even two subjects so agreeing in age, habit, mode of death, period of burial, &c. &c. as to allow of just comparison. With the lower animals the modifying agents are more under our control and adjustment; and it may, therefore, be hoped, that further trials,

pursued in that spirit of perseverance which is requisite for all successful interrogations of nature, will ultimately lead to satisfactory results.

For the excellent drawing annexed to this paper, I am indebted to my friend Mr. Fripp: it represents the stomach, duodenum, and commencement of the jejunum, taken from the disinterred body of Mrs. Smith.

A RETURN

OF

MEDICAL AND SURGICAL DISEASES,

TREATED AT H. M. COLONIAL HOSPITAL,

HOBART TOWN, VAN DIEMEN'S LAND,

FOR THE YEARS 1821 TO 1831.

BY JAMES SCOTT, ESQ.

Colonial Surgeon, (and Honorary Corresponding Member for Australasia.)

	1821.			1822.				1823.			
	Admitted during 1821.	Discharged.	Died.	Remained 31st Dec. 1821.	Admitted during 1822.	Discharged.	Died.	Remained 31st Dec. 1822.	Admitted during 1823.	Discharged.	Died.
Abortus, ...	...	...	...	...	...	...	...	...	...	...	...
Abscessus, ...	122	116	...	6	29	33	1	1	28	28	1
Accouchement,...	11	11	...	...	15	15	...	...	11	11	...
Amaurosis, ...	...	...	...	...	3	3	...	...	...	...	...
Ambustio,...	35	33	...	2	74	74	...	2	63	63	...
Amenorrhœa, ...	2	2	...	...	1	1	...	...	...	...	...
Anasarca, ...	4	1	3	...	11	8	3	...	6	4	2
Aneurisma, ...											
Apoplexia, ...	2	1	1	...	1	1	...	...	1	...	1
Ascites, ...	...	...	...	...	4	3	1	...	3	3	..
Asthma, ...	13	12	...	1	20	20	1	...	14	12	2
Atrophia, ...	7	3	2	2	7	8	1	...	9	8	1
Bronchitis, ...											...
Bubo, ...	...	...	...	...	10	10	...	...	20	20	...
Caligo, ...											
Caries, ...	3	2	1	...	6	5	...	1	4	5	...
Catarrhus, ...	113	108	...	5	67	71	...	1	55	56	...
Cephalalgia, ...	13	13	...	...	60	57	...	3	17	18	...
Cholera, ...	...	...	...	...	4	4	...	...	11	11	...
Chorea, ...	...	...	...	...	1	1	...	...	...	...	...
Colica, ...	...	...	...	...	22	22	...	...	3	3	...
Contusio, ...	186	183	...	3	143	143	...	3	93	90	...
Cynanche Tonsil.	16	14	1	1	27	26	2	...	13	12	...
Delirium Tremens,... ..											
Diarrhœa, ...	97	94	2	1	122	121	...	2	97	99	...
Dysenteria, ...	259	250	4	5	74	76	2	1	171	158	...
Dyspepsia, ...	98	97	...	1	54	54	...	...	109	109	...
Dysuria, ...	5	5	...	...	13	13	...	...	...	...	...
Entropium, ...											
Enteritis, ...	1	1	...	...	1	...	1	...	3	2	1
Epilepsia, ...	10	9	...	1	9	10	...	...	8	8	...
Epistaxis, ...	6	6	...	...	5	5	...	...	2	2	...
Eruptio, ...	214	212	...	2	176	178	...	...	142	140	...
Erysipelas, ...	22	22	...	...	3	1	...	2	22	22	...
Excoriatio, ...	...	...	...	...	39	39	...	...	9	8	...
Exostosis, ...											
Febris Continua et Ephem.	31	26	2	3	69	67	1	4	51	52	3
Fistula in Ano, ...	9	9	...	...	1	1	...	...	6	6	...
Fractura, ...	8	8	...	...	8	8	...	...	15	13	...
Furunculus, ...	...	...	...	...	115	112	...	3	28	31	...
Gastritis, ...	...	...	...	...	1	1	..	...	1	1	...
Gonorrhœa, ...	61	61	...	...	60	59	...	1	67	68	...

	1821.			1822.				1823.			
	Admitted during 1821.	Discharged.	Died.	Remained 31st Dec. 1821.	Admitted during 1822.	Discharged.	Died.	Remained 31st Dec. 1822.	Admitted during 1823.	Discharged.	Died.
Hepatitis, ...	34	34	...	...	7	7	...	...	26	18	1
Hernia, ...	54	54	...	...	23	22	1	...	57	56	...
Hæmatocele, ...	...	...	...	...	1	1	...	...	...	...	...
Hæmoptysis, ...	14	14	...	...	2	2	...	...	24	24	...
Hæmorrhoids, ...	22	22	...	...	15	15	...	...	35	35	...
Hydrocephalus, ...	...	...	...	...	1	...	1	...	...	...	...
Hydrothorax, ...	...	...	...	...	3	1	2	...	5	4	1
Hydrops Articuli, ...	...	...	...	...	1	1	...	...	...	...	...
——— Pericardii, . .											
Hydrocele,...	...	...	...	...	...	...	...	...	18	18	...
Hysteria, ...	...	...	...	...	5	5	...	...	8	8	...
Icterus, ...	11	11	...	...	3	3	...	...	3	3	...
Insania, ...	...	...	...	...	4	1	3	...	8	8	...
Ischuria, ...	...	...	...		...						
Leucorrhœa, ...	1	1		...	2	2	...	...	2	2	...
Luxatio, ...	2	2	...	...	10	10	...	...	1	...	...
Menorrhagia, ...	...	...	...	...	1	1	...	...	3	3	...
Morbus Cordis, ...	...	...	...	...	1	1	...	...	...	...	...
Necrosis, ...											
Nephritis, ...											
Obstipatio, ...	169	169	...	...	127	123	1	3	159	161	...
Odontalgia, ...	42	42	...	...	64	63	...	1	51	51	...
Ophthalmia, ...	80	77	...	3	69	72	...	...	84	80	1
Otitis.	...	...	...	...	5	5	...	...	14	13	...
Paralysis, ...	22	22	...	...	6	4	1	1	3	3	...
Paraphymosis, ...	...	...	...	...	3	3	...	...	...	...	...
Paronychia, ...	...	...	...	...	24	24	...	...	37	35	...
Pediculi, ...	...	...	...	...	10	10	...	...	...	...	...
Peritonitis, ...											
Phymosis, ...	...	...	...	...	1	1	...	...	...	...	...
Phlegmon, ...	...	...	...	...	27	26	...	1	57	54	...
Phrenitis, ...	1	..	1	...	...	...	...	...	...	...	...
Phthisis, ...	10	6	3	1	4	1	4	...	1	...	1
Plethora, ...	3	3	...	...	...	...	...	...	1	1	...
Pleuritis, ...											
Pneumonia, ...	58	57	...	1	103	101	2	1	8	7	1
Podagra, ...											
Prolapsus ani, ...	2	2	...	...	4	4	...	...	1	1	...
——— uteri, ...	...	...	...	..	...	...	...	...	2	2	...
Rheumatismus, ...	221	212	2	7	220	222	1	4	191	191	...
Ruptura Venæ Cor.... ...											
Scorbutus, ...	5	2	...	3	16	16	...	3	9	5	3
Schirrus, ...											
Scrofula, ...	7	7	...	...	9	8	...	1	7	7	...
Sphacelus, ...	...	...	...	...	...	...	...	...	1	...	1
Strictura, ...	18	18	...	...	8	8	...	...	21	21	...
Splenitis, ...											
Subluxatio, ...	18	18	...	...	57	54	...	3	37	38	...
Spasmi, ...											
Syphilis, ...	13	13	...	...	10	10	...	...	8	8	...
Testitis, ...	...	...	...	..	17	17	...	...	12	12	...
Tetanus, ...	1	1	...	...	2	...	2	...	2	2	...
Tumor, ...	1	...	...	1	14	14	...	1	3	4	...
Tympanites, ...	...	...	...	...	...	...	...	...	5	5	...
Ulcus, ...	268	263	...	5	194	191	...	8	198	199	1
Verminatio, ...	5	5	...	...	27	27	...	...	10	10	...
Venenatio, ...											
Verruca	...	...	...	...	3	3	...	...	...	...	...
Vertigo, ...	...	...	...	...	2	2	...	...	7	6	...
Vulnus, ...	204	197	2	5	229	223	1	10	130	130	1
Totals, ...	2634	2551	24	59	2592	2558	32	61	4121	4080	31

	1824.				1825.				1826.			
	Remained 31st Dec. 1823.	Admitted during 1824.	Discharged.	Died.	Remained 31st Dec. 1824.	Admitted during 1825.	Discharged.	Died.	Remained 31st Dec. 1825.	Admitted during 1826.	Discharged.	Died.
Abortus, ...	...	...	...	...	...	...	...	...	...	...	...	...
Abscessus, ...	...	54	54	...	...	8	7	...	1	28	29	...
Accouchement, ...	...	20	20	...	...	15	14	...	1	7	7	...
Amaurosis, ...	...	1	1	...	...	1	1	...	...	...	...	...
Ambustio, ...	2	101	100	...	3	67	69	...	1	109	108	1
Amenorrhœa, ...	...	1	1	...	...	2	2	..	...	5	5	...
Anasarca, ...	...	35	32	2	1	8	6	3	...	3	2	1
Aneurisma, ...	...	...	...	...	...	2	2	...	...	...	...	...
Apoplexia, ...	...	3	3	...	...	...	...	...	...	3	3	...
Ascites, ...	...	4	3	1	...	4	3	...	1	4	4	1
Asthma, ...	...	22	21	1	...	10	10	...	1	11	12	...
Atrophia, ...	...	15	14	1	...	8	8	...	...	11	8	...
Bronchitis, ...												
Bubo, ...	...	9	8	...	1	7	7	...	1	15	16	...
Caligo, ...	...	3	3	...	...	...	...	...	...	...	. .	...
Caries, ...	...	6	5	...	1	6	7	...	...	...	...	...
Catarrhus, ...	...	95	94	...	1	206	207	...	...	153	153	...
Cephalalgia, ...	2	84	86	...	...	22	22	...	...	84	83	1
Cholera, ...	...	5	5	...	...	...	...	...	...	...	...	...
Chorea, ...	...	...	..	...	...	...	...	...	...	...	...	...
Colica, ...	...	56	55	...	1	25	26	...	...	8	8	...
Contusio, ...	5	186	187	...	4	162	159	...	7	156	162	1
Cynanche Tonsil. ...	1	68	69	...	...	25	23	...	2	53	55	...
Delirium Tremens, ...												
Diarrhœa, ...	...	87	85	1	1	122	120	3	...	49	49	...
Dysenteria, ...	...	271	273	...	5	169	164	6	4	275	272	7
Dyspepsia, ...	...	62	62	...	...	44	43	...	1	57	58	...
Dysuria, ...	...	5	5	...	...	15	14	1	...	6	6	...
Entropium, ...												
Enteritis, ...	...	2	2	...	...	6	4	2	...	2	...	2
Epilepsia, ...	...	4	3	1	...	9	9	...	...	11	11	...
Epistaxis, ...	...	18	18	...	...	6	6	...	...	2	2	...
Eruptio, ...	2	161	163	...	...	119	118	...	1	135	132	...
Erysipelas, ...	1	12	13	...	...	2	2	...	...	...	...	...
Excoriatio, ...	1	54	54	...	1	14	15	...	...	21	21	...
Exostosis, ...	...	11	11	...	...	...	...	...	...	...	...	...
Febris Cont. et Eph.	...	135	135	...	...	87	83	4	...	95	80	6
Fistula in Ano, ...	...	3	3	...	...	4	2	1	1	3	4	...
Fractura, ...	2	34	35	...	1	40	39	...	2	16	12	1
Furunculus, ...	...	136	134	...	2	74	75	...	1	108	108	...
Gastritis, ...	...	...	...	...	...	1	1	...	...	2	1	1
Gonorrhœa, ...	...	103	100	...	3	101	104	...	...	57	57	...
Hepatitis, ...	7	25	30	2	...	19	19	...	...	13	9	3
Hernia, ...	1	51	52	...	...	23	23	...	...	32	32	...
Hæmatocele, ...	...	...	...	...	...	...	...	...	...	...	...	...
Hæmoptysis, ...	...	12	12	...	...	6	6	...	...	2	2	...
Hæmorrhoids, ...	...	31	31	...	...	12	12	...	...	6	6	...
Hydrocephalus, ...	...	1	...	1	...	...	...	...	...	...	...	...
Hydrothorax, ...	...	5	4	1	...	1	...	1	...	...	...	...
Hydrops Articuli, ...												
——— Pericardii, ...	...	...	...	...	...	1	...	1	...	...	...	...
Hydrocele, ...	...	9	9	...	...	2	2	...	...	4	4	...
Hysteria, ...	...	20	20	...	...	...	...	...	...	...	...	...
Icterus, ...	...	12	12	...	...	6	6	...	...	5	4	1
Insania, ...	...	8	1	...	7	12	9	2	8	9	10	...

	1824.				1825.				1826.			
	Remained 31st Dec. 1823.	Admitted during 1824.	Discharged.	Died.	Remained 31st Dec. 1824.	Admitted during 1825.	Discharged.	Died.	Remained 31st Dec. 1825.	Admitted during 1826.	Discharged.	Died.
Ischuria, ...												
Leucorrhœa, ...	...	11	11	..	...	...	...	...	...	2	2	...
Luxatio, ...	1	5	6	...	...	4	4	...	...	...	...	...
Menorrhagia, ...	...	5	5	...	...	...	...	...	...	...	...	...
Morbus Cordis, ...	...	1	1	...	...	...	...	...	...	...	...	...
Necrosis, ...												
Nephritis, ...	...	1	1	...	...	3	2	1	...	...	...	...
Obstipatio, ...	1	219	220	...	...	31	25	...	6	264	268	...
Odontalgia, ...	1	114	115	...	...	152	151	...	1	119	120	...
Ophthalmia, ...	3	112	112	...	3	136	132	...	7	121	119	...
Otitis, ...	1	20	21	...	...	11	11	...	...	19	19	...
Paralysis, ...	1	7	8	...	...	2	...	1	1	2	3	...
Paraphymosis, ...	...	1	1	...	...	2	2	...	...	...	...	...
Paronychia, ...	2	52	50	...	4	32	36	...	...	50	48	...
Pediculi, ...												
Peritonitis, ...												
Phymosis, ...												
Phlegmon, ...	4	56	57	1	2	111	109	...	4	78	77	...
Phrenitis, ...									...			
Phthisis, ...	...	5	3	2	...	3	1	2	...	20	10	10
Plethora, ...												
Pleuritis, ...	...	...	...	...	...	1	1	...	...	8	8	...
Pneumonia, ...	1	136	136	1	...	24	24	...	...	32	31	1
Podagra, ...												
Prolapsus ani, ...	...	5	5	...	...	1	1	...	...	1	1	...
——— uteri, ...												
Rheumatismus, ...	4	357	355	...	6	191	191	...	6	276	268	2
Ruptura Venæ Cor. ...	...	1	...	1	...	...	...	...	...	...	...	...
Scorbutus, ...	4	89	91	...	2	118	115	...	5	25	30	...
Schirrus, ...												
Scrofula, ...	1	20	18	1	2	9	9	2	...	9	8	1
Sphacelus, ...												
Strictura, ...	...	27	27	...	...	7	7	...	...	9	9	...
Splenitis, ...	...	...	...	...	...	3	3	...	...	...	...	...
Subluxatio, ...	2	100	100	...	2	59	60	...	1	33	33	...
Spasmi, ...												
Syphilis, ...	...	...	...	...	...	2	2	...	...	...	...	...
Testitis, ...	...	35	34	...	1	34	34	...	1	25	26	...
Tetanus, ...	...	...	...	...	...	5	5	...	...	...	...	...
Tumor, ...	...	19	18	...	1	7	6	1	1	16	15	...
Tympanites, ...	...	9	9	...	...	1	1	...	...	2	1	1
Ulcus, ...	6	243	233	...	16	138	145	...	9	148	149	...
Verminatio, ...	...	99	99	..	...	61	61	...	...	32	32	...
Venenatio, ...												
Verruca, ...												
Vertigo, ...	1	74	72	...	3	125	128	...	...	51	51	...
Vulnus, ...	9	347	352	1	3	292	282	2	11	278	287	...
Totals, ...	73	4207	4184	18	77	2756	2702	33	86	3180	3150	41

	1827.				1828.				1829.			
	Remained 31st Dec. 1826.	Admitted during 1827.	Discharged.	Died.	Remained 31st Dec. 1827.	Admitted during 1828.	Discharged.	Died.	Remained 31st Dec. 1828.	Admitted during 1829.	Discharged.	Died.
Abortus, ...	...	...	...	...	...	...	...	...	...	2	2	...
Abscessus, ...	...	11	10	1	...	35	33	1	1	39	38	1
Accouchement,... ...	1	5	5	...	1	7	8	...	...	2	2	...
Amaurosis, ...	...	1	1	...	...	...	...	...	...	3	3	...
Ambustio, ...	1	23	23	1	...	52	52	...	...	31	29	1
Amenorrhœa, ...	...	...	...	...	...	...	...	...	...	7	7	...
Anasarca, ...	...	4	3	1	..	13	12	1	...	28	22	5
Aneurisma, ...	...	...	...	...	...	1	...	1	...	1	1	...
Apoplexia, ...	...	1	...	1	...	1	...	1	...	3	3	...
Ascites, ...	...	1	1	...	...	1	1	...	...	4	3	1
Asthma, ...	...	3	3	...	...	11	9	1	1	9	10	...
Atrophia, ...	3	8	1	6	4	10	3	11	...	7	4	1
Bronchitis, ...	...	...	..	...	...	...	...	...	...	1	...	1
Bubo, ...	...	2	1	...	1	13	14	...	...	11	10	...
Caligo, ...												
Caries, ...	...	1	...	1	...	1	...	...	1	...	1	...
Catarrhus, ...	...	325	321	2	2	210	211	...	1	185	183	1
Cephalalgia, ...	...	74	74	...	...	24	24	...	...	60	59	...
Cholera, ...	...	...	...	...	...	...	...	...	...	6	6	...
Chorea, ...												
Colica, ...	...	10	10	...	...	18	18	...	...	25	25	...
Contusio, ...	...	153	150	1	2	146	147	...	1	83	82	...
Cynanche Tonsillaris,	...	25	24	...	1	49	50	...	...	41	41	...
Delirium Tremens, ...												
Diarrhœa, ...	...	36	36	...	...	33	33	...	...	43	41	1
Dysenteria, ...	...	143	139	4	..	132	120	11	1	124	114	11
Dyspepsia, ...	...	44	43	...	1	60	61	...	...	65	64	...
Dysuria, ...	...	4	4	...	...	9	9	...	...	8	8	...
Entropium, ...												
Enteritis, ...	...	2	1	1	...	11	10	1	...	8	8	...
Epilepsia, ...	...	3	1	1	1	16	17	...	...	12	12	...
Epistaxis, ...	...	...	...	...	...	3	2	...	1	2	3	...
Eruptio, ...	4	109	112	...	1	96	100	...	1	78	79	...
Erysipelas, ...	...	5	3	1	1	17	17	1	...	5	5	...
Excoriatio,...	...	11	11	...	...	3	3	...	...	6	6	...
Exostosis, ...	...	2	2	...	...	...	...	...	...	3	3	...
Febris Cont. et Eph.	9	88	89	7	1	66	47	12	8	67	69	4
Fistula in Ano, ...	...	1	...	1	...	1	...	...	1	4	2	1
Fractura, ...	5	25	24	2	4	19	18	..	5	12	15	...
Furunculus, ...	1	106	107	...	...	88	87	...	1	57	57	...
Gastritis, ...	...	1	1	...	...	...	...	...	...	...	...	...
Gonorrhœa, ...	...	41	41	...	...	33	33	...	...	30	30	...
Hepatitis, ...	1	17	15	3	...	29	28	...	1	21	20	1
Hernia, ...	...	18	18	...	...	25	24	...	1	25	26	...
Hæmatocele, ...	...	...	...	...	...	...	...	...	...	1	1	...
Hæmoptysis, ...	...	2	2	...	...	8	7	...	1	8	9	...
Hæmorrhoids, ...	...	12	11	...	1	17	18	...	...	21	20	...
Hydrocephalus, ...	...	...	...	...	...	1	...	1	...	...	...	...
Hydrothorax, ...	...	...	...	...	...	2	...	2	...	2	...	2
Hydrops Articuli, ...	...	1	1	...	...	...	...	...	...	...	...	...
——— Pericardii,...	...	1	...	1	...	...	...	...	...	2	1	1
Hydrocele, ...	...	1	1	...	...	...	...	...	...	5	5	...
Hysteria, ...	...	2	2	...	...	1	1	...	...	...	...	...
Icterus, ...	...	7	7	...	...	20	19	1	...	6	5	1
Insania, ...	7	6	2	2	9	4	2	2	9	9	3	2

	1827.				1828.				1829.			
	Remained 31st Dec. 1826.	Admitted during 1827.	Discharged.	Died.	Remained 31st Dec. 1827.	Admitted during 1828.	Discharged.	Died.	Remained 31st Dec. 1828.	Admitted during 1829.	Discharged.	Died.
Ischuria, ...	...	3	3	...	...	...	...	...	...	3	3	...
Leucorrhœa, ...	...	2	2	...	...	11	11	...	...	1	1	...
Luxatio, ...	...	1	1	...	...	...	...	...	...	4	4	...
Menorrhagia, ...	...	1	1	...	...	2	2	...	...	3	3	...
Morbus Cordis, ...	...	...	...	...	...	...	...	...	...	2	1	1
Necrosis, ...	...	1	1	...	...	4	4	...	...	...	...	...
Nephritis, ...	...	3	3	...	...	1	...	1	...	1	...	...
Obstipatio, ...	2	196	198	...	...	168	168	...	...	169	169	...
Odontalgia, ...	...	137	137	...	...	108	108	...	...	111	111	...
Ophthalmia, ...	9	81	85	...	5	45	43	...	7	58	63	...
Otitis, ...	...	6	6	...	...	12	12	...	...	12	12	...
Paralysis, ...	...	4	3	...	1	8	6	3	1	...	...	1
Paraphymosis, ...												
Paronychia, ...	2	41	43	...	...	60	57	...	3	35	37	...
Pediculi, ...												
Peritonitis, ...												
Phymosis, ...												
Phlegmon, ...	5	56	60	...	1	160	158	1	2	52	51	...
Phrenitis, ...												
Phthisis, ...	...	5	2	...	3	18	9	11	1	14	7	7
Plethora, ...												
Pleuritis, ...	...	22	22	...	...	19	18	...	1	7	8	...
Pneumonia, ...	...	14	13	1	...	...	...	...	...	7	7	...
Podagra, ...	...	...	...	...	...	...	...	...	...	2	2	...
Prolapsus ani, ...												
——— uteri, ...												
Rheumatismus, ...	12	144	152	...	4	199	202	...	1	174	172	...
Ruptura Venæ Cor. ...												
Scorbutus, ...	...	11	11	...	...	21	21	...	...	17	14	...
Scirrhus, ...	...	...	...	...	...	...	...	...	...	2	2	...
Scrofula, ...	...	5	4	...	1	2	3	...	...	3	2	...
Sphacelus, ...												
Strictura, ...	...	7	6	1	...	19	17	1	1	6	4	2
Splenitis, ...												
Subluxatio, ...	1	27	27	...	1	26	27	...	...	30	30	...
Spasmi, ...	...	...	...	...	...	6	6	...	...	4	4	...
Syphilis, ...												
Testitis, ...	...	13	13	...	...	17	17	...	...	10	10	...
Tetanus, ...	...	1	1	...	...	...	...	...	...	2	1	1
Tumor, ...	2	18	17	...	3	26	27	1	1	20	19	...
Tympanites, ...	...	...	...	...	...	...	...	...	...	...	...	...
Ulcus, ...	8	116	122	...	2	106	104	1	3	67	68	...
Verminatio, ...	...	39	39	...	...	21	21	...	...	37	37	...
Venenatio, ...												
Verruca, ...	...	...	...	...	...	...	...	...	...	1	1	...
Vertigo, ...	...	39	36	...	3	11	12	...	2	21	23	...
Vulnus, ...	2	186	184	1	3	171	168	1	5	94	95	3
Totals, ...	75	2513	2488	40	57	2528	2458	67	63	2144	2101	50

	1830.				1831.				
	Remained 31st Dec. 1829.	Admitted during 1830.	Discharged.	Died.	Remained 31st Dec. 1830.	Admitted during 1831.	Discharged.	Died.	Remained 31st Dec. 1831.
Abortus, ...	...	2	2	...	...	...	...	...	...
Abscessus, ...	1	15	15	1	...	62	59	1	2
Accouchement, ...	...	1	1	...	...	...	...	...	...
Amaurosis, ...	...	1	1	...	...	4	4	...	...
Ambustio, ...	1	32	29	3	1	36	35	2	...
Amenorrhœa, ...	...	4	4	...	...	12	12	...	...
Anasarca, ...	1	23	18	4	2	15	11	5	1
Aneurisma, ...	...	5	3	2	...	2	1	...	1
Apoplexia, ...	...	8	3	5	...	1	...	1	...
Ascites, ...	...	2	...	1	1	3	3	1	...
Asthma, ...	...	5	5	...	...	7	7	...	...
Atrophia, ...	2	14	11	4	1	19	9	8	3
Bronchitis, ...	...	...	...	...	...	1	1	...	...
Bubo, ...	1	10	11	...	...	29	28	...	1
Caligo, ...	...	...	...	...	...	1	...	...	1
Caries, ...	...	2	2	...	...	2	2	...	...
Catarrhus, ...	2	153	153	...	2	95	93	1	3
Cephalalgia, ...	1	55	55	1	...	41	41	...	...
Cholera, ...	...	1	1	...	...	2	2	...	...
Chorea, ...	...	2	2	...	...	2	2	...	...
Colica, ...	...	31	31	...	...	38	38	...	...
Contusio, ...	2	97	96	...	3	139	141	1	...
Cynanche Tonsillaris, ...	...	27	27	...	...	31	31	...	...
Delirium Tremens, ...	...	1	1	...	...	5	5	...	...
Diarrhœa, ...	1	49	49	1	...	107	105	...	2
Dysenteria, ...	...	107	94	5	8	115	116	6	1
Dyspepsia, ...	1	42	42	1	...	50	50	...	...
Dysuria, ...	...	19	19	...	...	9	8	1	...
Entropium, ...	...	1	1	...	...	2	2	...	...
Enteritis, ...	...	5	4	1	...	2	1	1	...
Epilepsia, ...	...	6	6	...	...	3	2	...	1
Epistaxis, ...	...	3	3	...	...	...	...	...	...
Eruptio, ...	...	98	95	...	2	129	128	...	3
Erysipelas, ...	...	...	...	...	...	11	11	...	...
Excoriatio, ...	...	1	1	...	...	3	3	...	...
Exostosis, ...	...	2	1	...	1	...	1	...	...
Febris Continua et Ephem.	2	70	60	5	7	338	322	18	5
Fistula in Ano, ...	2	4	5	1	...	...	...	...	...
Fractura, ...	2	9	5	1	5	19	19	1	4
Furunculus, ...	1	66	66	...	1	96	96	...	1
Gastritis, ...	...	...	...	...	...	2	2	...	...
Gonorrhœa, ...	...	33	32	...	1	51	52	...	...
Hepatitis, ...	1	18	17	2	...	19	17	2	...
Hernia, ...	...	29	29	...	...	26	26	...	...
Hæmatocele, ...	...	1	1	...	...	...	...	...	...
Hæmoptysis, ...	...	5	2	3	...	15	12	1	2
Hæmorrhoids, ...	1	10	11	...	...	5	5	...	...
Hydrocephalus, ...	...	1	...	1	...	...	...	...	...
Hydrothorax, ...									
Hydrops Articuli, ...									
——— Pericardii, ...	...	1	...	1	...	2	...	2	...
Hydrocele, ...	...	1	...	...	1	6	6	...	...
Hysteria, ...	...	1	1	...	...	3	3	...	...
Icterus, ...	...	3	3	...	...	6	6	...	...
Insania, ...	13	7	2	2	16	26	27	2	13

	1830.				1831.				
	Remained 31st Dec. 1829.	Admitted during 1830.	Discharged.	Died.	Remained 31st Dec. 1830.	Admitted during 1831.	Discharged.	Died.	Remained 31st Dec. 1831.
Ischuria, ...	...	...	...	...	...	3	3	...	...
Leucorrhœa, ...	...	2	2	...	...	4	4	...	...
Luxatio, ...	...	...	...	...	...	1	1	...	...
Menorrhagia, ...	...	2	1	1	...	8	8	...	...
Morbus Cordis, ...	...	1	1	...	...	8	8	...	...
Necrosis, ...									
Nephritis, ...	1	...	1	...	...	7	7	...	...
Obstipatio, ...	...	133	131	...	2	116	117	...	1
Odontalgia, ...	...	116	116	...	...	120	120	...	...
Ophthalmia, ...	2	47	46	...	3	101	96	...	8
Otitis.	...	4	4	...	...	7	7	...	...
Paralysis, ...	...	8	5	2	1	8	5	4	...
Paraphymosis, ...	...	...	...	...	...	1	1	...	...
Paronychia, ...	1	46	47	...	...	49	49	...	...
Pediculi, ...	...	...	...	...	...	2	2	...	...
Peritonitis, ...	...	2	1	1	...	9	8	1	...
Phymosis, ...	...	...	...	...	...	1	1	...	...
Phlegmon, ...	3	67	69	...	1	46	45	...	2
Phrenitis, ...	...	...	...	...	...	1	...	1	...
Phthisis, ...	1	11	8	4	...	13	5	8	...
Plethora, ...	...	...	...	...	...	2	2	...	...
Pleuritis, ...	...	13	12	1	...	61	59	1	1
Pneumonia, ...	...	1	1	...	...	2	1	1	...
Podagra, ...									
Prolapsus ani, ...	...	1	1	...	...	...	...	...	...
——— uteri, ...									
Rheumatismus, ...	3	203	203	...	3	252	251	...	4
Ruptura Venæ Cor.									
Scorbutus, ...	3	14	15	...	2	74	74	1	1
Scirrhus, ...	...	1	...	1	...	1	1	...	...
Scrofula, ...	1	4	3	1	1	18	18	1	...
Sphacelus, ...									
Strictura, ...	1	2	3	...	...	7	7	...	...
Splenitis, ...									
Subluxatio, ...	...	16	15	...	1	24	25	...	...
Spasmi, ...	...	4	4	...	...	...	...	...	...
Syphilis, ...									
Testitis, ...	...	11	10	...	1	25	24	...	2
Tetanus, ...									
Tumor, ...	2	30	30	...	2	5	7	...	...
Tympanites, ...									
Ulcus, ...	2	73	73	2	...	154	149	1	4
Verminatio, ...	...	21	21	...	...	6	6	...	...
Venenatio, ...	...	1	1	...	...	1	1	...	...
Verruca	...	1	...	...	1	3	4	...	...
Vertigo, ...	...	11	11	...	...	15	15	...	...
Vulnus, ...	1	91	89	1	2	166	161	2	5
Totals, ...	56	2020	1945	59	72	2913	2836	75	72

The yearly totals at the foot of each column of the preceding tables, were printed from Mr. Scott's manuscript, but as it has since been ascertained are not to be depended upon. The following will be found to be correct

	Remaining.	Admitted.	Discharged.	Died.	Remained on 31st Dec.
1821,.....	...	2634	2551	24	59
1822,.....	59	2589	2554	32	61
1823,.....	61	2331	2288	22	66
1824,.....	66	4210	4188	18	77
1825,.....	77	3038	2997	33	86
1826,.....	86	3180	3150	41	75
1827,.....	75	2514	2492	40	57
1828,.....	57	2527	2459	67	63
1829,.....	63	2146	2103	50	56
1830,.....	56	2020	1944	59	72
1831,.....	72	2913	2837	75	72
Totals,.....	...	30102	29563	461	...

The discrepancies are owing to errors in the columns in Mr. Scott's manuscript, which appear to have arisen from some irregularity in entering the cases discharged, and will not, therefore, affect the actual number of cases admitted, or the resulting mortality.

The following Table, exhibiting the general Totals, has been calculated from the yearly columns of Mr. Scott. The discrepancies which exist arise from errors in those columns before alluded to.

	Admitted.	Discharged.	Died.	Remaining.
Abortus, ...	4	4	...	...
Abscessus, ...	431	422	7	2
Accouchement, ...	94	94	...	...
Amaurosis, ...	14	14	...	...
Ambustio, ...	623	615	8	..
Amenorrhœa, ...	34	34	...	...
Anasarca, ...	150	119	30	1
Aneurisma, ...	11	7	3	1
Apoplexia, ...	24	14	10	...
Ascites, ...	30	24	6	...
Asthma, ...	125	121	5	...
Atrophia, ...	115	77	35	3
Bronchitis, ...	2	1	1	...
Bubo, ...	126	125	...	1
Caligo, ...	4	3	...	1
Caries, ...	31	29	2	...
Catarrhus, ...	1657	1650	4	3
Cephalalgia, ...	534	532	2	...
Cholera, ...	29	29	...	...
Chorea, ...	5	5	...	.
Colica, ...	236	236	...	...

	Admitted.	Discharged.	Died.	Remaining.
Contusio, ...	1544	1540	3	...
Cynanche Tonsillaris, ...	375	372	3	...
Delirium Tremens, ...	6	6	...	...
Diarrhœa, ...	842	832	8	2
Dysenteria, ...	1840	1776	56	1
Dyspepsia, ...	685	683	1	...
Dysuria, ...	93	91	2	...
Entropium, ...	3	3	...	...
Enteritis, ...	43	33	10	...
Epilepsia, ...	91	88	2	1
Epistaxis, ...	47	47	...	...
Eruptio, ...	1457	1457	...	3
Erysipelas, ...	99	96	2	...
Excoriatio, ...	161	161	...	...
Exostosis, ...	18	18	...	...
Febris Continua et Ephem.	1097	1030	62	5
Fistula in Ano, ...	36	32	4	...
Fractura, ...	205	196	5	4
Furunculus, ...	874	873	...	1
Gastritis, ...	8	7	1	...
Gonorrhœa, ...	637	637	...	...
Hepatitis, ...	228	214	14	...
Hernia, ...	363	362	1	...
Hæmatocele, ...	3	3	...	...
Hæmoptysis, ...	98	92	4	2
Hæmorrhoids, ...	186	186	...	...
Hydrocephalus, ...	4	...	4	...
Hydrothorax, ...	18	9	9	...
Hydrops Articuli, ...	2	2	...	...
——— Pericardii, . .	7	1	6	...
Hydrocele, ...	46	45	...	...
Hysteria, ...	40	40	...	...
Icterus, ...	82	79	3	...
Insania, ...	93	65	15	13
Ischuria, ...	9	9	...	...
Leucorrhœa, ...	38	38	...	...
Luxatio, ...	28	28	...	...
Menorrhagia, ...	30	29	1	...
Morbus Cordis, ...	13	12	1	...
Necrosis, ...	5	5	...	...
Nephritis, ...	16	14	2	...
Obstipatio, ...	1751	1749	1	1
Odontalgia, ...	1134	1134	...	...
Ophthalmia, ...	934	925	1	8
Otitis.	110	110	...	...
Paralysis, ...	70	59	12	...
Paraphymosis, ...	7	7	...	...
Paronychia, ...	426	426	...	...
Pediculi, ...	12	12	...	...
Peritonitis, ...	11	9	2	...
Phymosis, ...	2	2	...	...
Phlegmon, ...	710	706	2	2
Phrenitis, ...	2	...	2	...
Phthisis, ...	104	52	52	...
Plethora, ...	6	6	...	...
Pleuritis, ...	131	128	2	1
Pneumonia, ...	385	378	7	...
Podagra, ...	2	2	...	...
Prolapsus ani, ...	15	15	...	...
——— uteri, ...	2	2	...	...
Rheumatismus, ...	2428	2419	5	4
Ruptura Venæ Cor.	1	...	1	...

	Admitted.	Discharged.	Died.	Remaining.
Scorbutus, ...	399	394	1	1
Scirrhus, ...	4	3	1	...
Scrofula, ...	93	87	6	..
Sphacelus, ...	1	...	1	...
Strictura, ...	131	127	4	...
Splenitis, ...	3	3	...	...
Subluxatio, ...	427	427	...	...
Spasmi, ...	14	14	...	...
Syphilis, ...	33	33	...	...
Testitis, ...	199	197	...	2
Tetanus, ...	13	10	3	...
Tumor, ...	159	157	2	...
Tympanites, ...	17	16	1	...
Ulcus, ...	1705	1696	5	4
Verminatio, ...	358	358	...	...
Venenatio, ...	2	2	...	...
Verruca	8	8	...	...
Vertigo, ...	356	356	...	...
Vulnus, ...	2188	2168	15	5
Totals, ...	30102	29563	461	72

Upon assuming the duties of H. M. Colonial Surgeon to this Island in 1821, I began with an anxious desire to ascertain the nature and prevalence of disease in the Colony, and from minute enquiry and observation at that time, I ascertained several peculiarities, which a longer and greater experience enables me to submit as accurate.

The Medical Topography of Van Diemen's Land is not less peculiar than are its vegetable and animal productions, as situations apparently unhealthy are inhabited with the utmost freedom without injury to the constitution, though in any other country they would probably be attended with inevitable destruction, or, at least, much hazard to human life.

The climate is very peculiar, presenting phenomena as if the different seasons were blended together. There are more frequent and sudden changes of the atmosphere than in many other climates; but these seem to operate by reducing the susceptibility to disease, instead of increasing it, as the alterations from heat to cold, from clear weather to foul, and *vice versa*, are not succeeded by the same baneful consequences to the human body as in other countries, nor are they followed by epidemic or contagious diseases. Epidemics, indeed, can, as yet, scarcely be said to have appeared, except on two occasions: the first of these was an epidemic influenza, attended by great determination to the head and congestion, with prostration of strength, bordering on the catarrhus senilis of Cullen, which carried off many persons infirm from age; the second was an epidemic continued fever, accompanied with a more than usual deficiency of nervous energy and serious local determinations to the peritoneum, intestines, and membranes of the brain.

Vaccine virus is introduced with difficulty, and soon becomes ineffective. Of syphilis I have seen but few cases, (not more than six of the primary symptoms,) in the Island, and even those were imported from Sydney and the Isle of France; they were never known to extend.

For phthisical patients, the climate is too variable, and, consequently, too stimulating, and when the disease is once fully formed, the symptoms become severe, and the sufferer rapidly sinks.

From the peculiarity of the climate, scrofula and glandular diseases are rare. Idiopathic intermittent fever, malignant cynanche, small pox, measles, scarlet fever, hydrophobia, &c. &c. have not been met with in the Colony. Hooping cough was once introduced, and, for a short time, extended as rapidly and extensively as in England, but gradually became milder, and in a few months disappeared.

Parturition is, in general, rapid and easy, and followed by a favourable restoration to health.

The diseases, both acute and chronic, are generally mild and of comparatively short duration, and yield more easily to the usual remedies, than in any other country where I have practised, or of which I have read.

The general duration of life is not yet known, but is expected to be high, on account of the mild temperature and other general qualities of the climate, which seem to have a beneficial tendency to preserve the animal functions in order.

It is proper to observe, that the greater number of the acute cases included in the accompanying return, were brought on by intemperance, imperfect clothing, and exposure to wet and cold; and that the greater part of the patients were European convicts, of the most dissolute habits and broken constitutions, and, consequently, predisposed to all kinds of disease. When allowed, however, to have fair play, such is the salutary effect of the climate on such persons, and more particularly on Europeans enervated by a residence in India, that their constitutions, after a short stay in the Colony, become invigorated, and, as it were, renovated; and I am of opinion that valetudinarians in general, will no where find a climate more conducive to their health than that of Van Diemen's Land.

J. SCOTT.

Hobart Town, Van Diemen's Land,
5th September, 1833.

CORRECTION AND ADDITION TO THE LIST OF MEMBERS.

William W. Squires, M. D., Senior Physician to the Northern Hospital, Liverpool.
Charles Cowan, M. D., Bath.

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Page 103, line 5, *for* every *read* even.

—— 115, Examples of Structures illustrating second species of *Reticulo-Secreting textures* to be transferred to species third, and the reverse.

—— 116, line 12, *for* connected *read* included.

—— 119, —— 19, *for* class a *read* genus 2nd.

—— 133, —— 5, *for* nervous *read* venous.

—— 135, —— 17, *for* secreting *read* secreted.

—— 136, —— 32, *for* veins *read* vessels.

—— 145, —— 4, *for* cannot *read* must.

—— 156, —— 24, *for* volumes *read* columns.

—— 158, —— 11, *for* pores *read* pons.

—— 163, —— 31, *for* inquiring *read* inquiry.

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EDITED BY

ROBERT B. TODD, M.B.

Candidate of the Royal College of Physicians, and Lecturer on Anatomy and Physiology;

AND

ROBERT E. GRANT, M.D. F.R.S.E.

Fellow of the Royal College of Physicians, Edinburgh, Professor of Comparative Anatomy and Zoology in the London University, &c. &c.

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PROSPECTUS.

There is no one, we may venture to assert, in any way connected with the Medical Profession, and particularly with the practical part of it, who is not more or less frequently obliged to refresh his memory with respect to the groundwork, or the fundamental principles, on which he has laid, and on which he is raising the superstructure of his professional experience; and who is not animated by the desire of being made summarily acquainted with the progress of Anatomico-Physiological science, or who, we will be bold to add, has not often had occasion to lament that the information which he seeks is placed beyond his reach; that it is contained in voluminous treatises, (for the most part, too, in foreign languages,) purchaseable at an expense beyond the means of the generality of persons; and when deposited in libraries to which he may have access, rendered in a great measure useless to him there, from the circumstance that the knowledge which is wanted is most probably demanded by an emergency, or at least on an occasion which may afford a very limited time for its acquisition.

That the sciences of animal structure and functions—both in health and disease—have, within the last half century, made great and rapid progress, is a fact sufficiently attested by a reference to the names of the illustrious contributors to their advancement. The works of Haller—of Scarpa—of the Meckels—the Söemmerings—the Bells—of Baillie and Cooper—Tiedemann and Rudolphi—of Cuvier, Blainville, and Geoffroy St. Hilaire, and a host of others, are of themselves sufficient to constitute a library of no ordinary size. But whilst we cannot but admire the improvements and additions which each has made in his particular departments, it must likewise be confessed that much of what is contained in the writings of the distinguished individuals alluded to, is merely in corroboration of what had been already given to the world by their predecessors: many of their most valuable essays, too, are to be found scattered

through various periodical publications, difficult, nay impossible, of access to the generality of readers. To collect, therefore, all that is known and determined in these sciences,—to separate the new matter of each eminent investigator of them,—to consolidate and mould into form the whole,—would be an undertaking, the utility of which must be universally admitted, and the necessity for which, at the present time, can hardly be questioned.

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Professor of the Institutes of Medicine in the University of Edinburgh.

VICTOR AUDOUIN, M.D. Paris.
Professeur-Administrateur au Musee d'Histoire Naturelle.

THOMAS BELL, ESQ. F.R.S.
Lecturer on Comparative Anatomy, Guy's Hospital.

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H. DUTROCHET, M.D.
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R. D. GRAINGER, ESQ.
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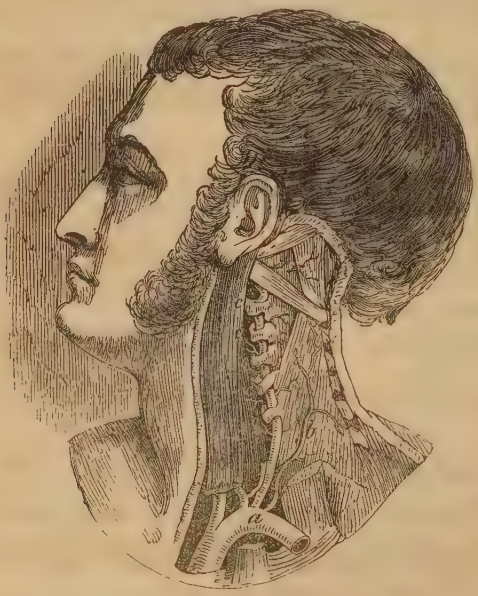

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